Negotiating Gross National Happiness as Community Economy: A Case Study of the Thimphu River

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Abstract

In recent years, the ecological health of the Thimphu River in Bhutan has been deteriorating. This leads to questions about the values that are ingrained in the Government's development philosophy, known as gross national happiness. This study presents how the physical status of the Thimphu River and people's behaviours around the river are influenced by modern, materialistic approaches, which challenge traditional, spiritual and cultural values. The objective is to understand local communities' connections with the river, which foster perceptions of its worth, and thus frame behaviours towards the river. I used semi-structured interviews and group discussions with adults and students to gather data. I also performed a participatory rapid appraisal with local nuns, and I made direct field observations. I found that the Thimphu River has been exploited by local residents and communities living near it, resulting in its degradation. A disconnect from traditional spiritual and cultural values is evident in the waterways' degraded state. Herein, I explore a new management approach, which could lead to sustainable river use. I explore new approaches to river management fostered by reconnecting to traditional, spiritual values, which are the core foundations of gross national happiness. I suggest re-negotiating Bhutan's gross national happiness as a community economy, with particular reference to the ethics of taking care of a common resource belonging to all and fostering ethical behaviours through the ethical concern of encountering others.

Keywords: Bhutan; Gross national happiness; Thimphu River; community economies; commoning; geographies of the more-than-human.

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Glossary

Bumpa	Ritual vase with a spout used in Tibetan Buddhist rituals and empowerments
Deljor	The freedom and endowment of life
Delwa	Freedom
Drukpa Kagyu	Tibetan Buddhism, a religious lineage practiced in the country of Bhutan
Driglam / Namzha	Drukpa is the way of having order and conformity. Namzha is a concept or system. Together with driglam, a system or the order of cultural behaviour
Drib	Defilement and pollution
Gakyid	Happiness
Gewog	County
Gyep	Lord / deities / spirits
Gup	Head of the village
Jorpa	Wealth
Karma	Cause and effect
Lu	Deities and spirits in the form of a human body joined to a reptilian lower body
Menchhu	Medicinal spring
Naga	Sanskrit version of Lu (see entry above)
Nep	Lord / deities / spirits
Padyatra	Journey on foot
Phajo dugom zhigpo	Tibetan Buddhist, particularly important in the early spread of the Drukpa school to Bhutan, where Drukpa is revered as an emanation of Avalokiteśvara
Peljore gongphel	Economic development
Rongchu	Small stream
Stupa	A dome shaped building erected as Buddhist shrine
Tsachhu	Hot spring
Tshogpa	Community leader

Tshomen mo	Lake woman with lower body of a Lu, who is reptilian in shape and joins with his or her human upper body
Yargey gonphel	Development
Yoencha	Seven bowls of offering
Zhabdrung Ngawang Namgyel	Founder of Bhutan

Chapter 1: Bhutan and the Age of the Anthropocene

Water is an essential component of life on earth. The rising demand for water, emerging in response to human population increases and urbanisation, has resulted in the diversion of water sources towards urban areas. In some countries, groundwater is over-extracted and river basins are over-committed, with fewer healthy environmental flows, more water pollution and more seawater intrusion. With increases in population, stresses on the environment, particularly on water resources, have been increasing worldwide.

In 2007, urban residents outnumbered the rural population worldwide for the first time in history. By the year 2050, 70% of the world's population is expected to reside in urban areas (Allison, 2014). With this rural-to-urban migration, it is expected that other environmental issues will be compounded, such as air and water pollution. It seems certain that the future is bleak for our world's natural resources and environments. Around the globe, people are facing various kinds of water-related issues, from water scarcity to floods. In the midst of fulfilling consumption demands, we humans have appropriated natural resources such as land, water, air and forests, thus transforming natural ecosystems; replenishment needs for the nonhuman environment have been overlooked, causing issues like environmental degradation and ecological disruption. Activities such as large-scale mining, urbanisation and agriculture have led to the disappearance of forests, and along with these forests, global water sources have disappeared, resulting in the drying up of many rivers and lakes. Various actions by humans have become a new planetary force with accelerating effects on the environment, and this era is now known as the era of the Anthropocene (Gibson-Graham et al., 2015). In the words of Weir (2009), "ecocide" has happened already, which means that human-made environmental destruction has destroyed life-sustaining wetlands and freshwater ecologies on a global scale.

The country of Bhutan is no different than the rest of the world in experiencing these issues. With only very recent modernisation, the country's historic isolation and conservatism have been maintained to an extent. However, the dichotomy of tradition and modernity has manifested in various fields like education, health, environmental management and conservation (Phuntsho, 2000). Although Bhutan is a country with abundant water resources, it still faces issues of water accessibility (National Environment Commission [NEC], 2016). Furthermore, with the pursuit of economic development, an increasing population and the change in

lifestyles modernity has brought, there is an increasing demand for water. In recent years, competition for water has emerged for the first time, with drinking water supplies, water for agricultural production and water used in hydropower generation under threat (NEC, 2016). The present management of water and the way the Bhutanese people perceive nature is now aligning towards modern thinking, with more people becoming disconnected from traditional views and ancient ways of managing water resources. Water issues are now more about treating water as a commodity or economic resource, what Weir (2009) has described as "modern thinking", an insidious change that has destroyed the Murray River Basin in Australia, where water management is focused on water as a commodity for humans to exploit (Weir, 2009). Weir (2009) has compared this modern commodity approach with the indigenous ways of thinking about water management in Australia, and has captured the contrast between the modern and the holistic approach in understanding how to manage water to benefit everyone, a contrast evident in Bhutan today.

Although the health of the Thimphu River and other rivers in Bhutan is slowly degrading, human's economic needs and priorities are still being placed ahead of biodiversity, similar to the situation in Australia's Murray River basin (Weir, 2009). The connection of the Bhutanese with nature and their environment, which is the founding concept of the national philosophy of "gross national happiness" (GNH), is slowly being eroded. The good news is that there is still hope and optimism in rural parts of the country, which are not fully exposed to the forces of modernisation and consumerism. The sense of oneness with nature is still not completely lost in these localities of Bhutan. Indeed, the lives of those people who are living in these localities are shaped by their beliefs in worshiping nature, landscapes and forests, a belief structure that means they consider natural sites as holy (Allison, 2015).

The majority of Bhutanese people follow *Drukpa Kagyu*, a branch of the Himalayan School of Buddhism. According to Ura (2001), the Himalayan Mountains were believed to be haunts for hostile spirits who needed to be tamed, and these spirits were tamed by Guru Rinpoche, the second Buddha, when he introduced Buddhism to the region. The hostile spirits who were tamed became local deities, the protectors of Buddhism and caretakers of the environment in the vicinity. Thus, in most parts of Bhutan, older people revere nature. Rituals and traditions embrace nature and showcase a "living in harmony with nature" approach, which is also a way of showing respect to the environment. Indeed, Buddhist beliefs are synthesised with

an older, indigenous religion known as Bon, which also directs people to revere nature (Ura, 2001). Human practices thus highlight beliefs in interdependence with our environment. However, in urban areas, particularly in the capital city of Thimphu, traditional beliefs about nature, especially rivers, are slowly diminishing.

Despite the kingdom of Bhutan being known throughout the world for its environmentally friendly policies, especially in the area of forest preservation, a recent, acute drinking water shortage and the drying up of water sources with unpredictable monsoon rains, has been front page news. Rural people are beginning to experience the devastating side effects of development that disrupts their normal ways of living in harmony with the ecosystems that support them. The era of the Anthropocene (or, as some call it, the "Capitalocene" era) (Gibson-Graham, 1996) is slowly creeping into the country. It may not be too long until Bhutan faces a major crisis, worsened by climate change scenarios.

Thimphu City residents are already witnessing the signs of development going wrong. Recent years have seen an increasing number of cars, multi-storeyed buildings, sewage overflows, plastic litter, landfills scarring the hillsides, and the mushrooming of small shanty settlements in the peripheries of Thimphu, and even in the midst of the city. Thimphu has also witnessed the encroachment of developments on land closer to the mountains, with buildings nestling dangerously close to the areas where forest fires are common. These are some of the vivid examples of the impacts of modernisation. The question then arises about whether the country of Bhutan can overcome the trends of the Anthropocene by living in harmony with non-human others.

Bhutan is known for stringent regulations when it comes to environmental preservation. The concept of GNH has played an important part and has helped to ensure that 60% of the country stays covered in forests (Tobgye, 2015. Furthermore,

> The Nation must protect our sacred environment to protect the sentient beings. Consequently, Bhutan made a conscious decision to place environmental protection at the centre of national policy and preserve the spectacular wildlife and habitats. Bhutan can draw satisfaction of its success in the preservation of its natural environment, which has become an outstanding example for the rest of the world. The Bhutanese people have many reasons to be truly happy and proud of their achievements. (Tobgye, 2015 p. 77)

The concept of having 60% of the country covered with forests at all the times is also enshrined in the official Constitution of the Kingdom of Bhutan. Article 5, section 3 of the Constitution says, "The Government shall ensure that, in order to conserve the country's natural resources and to prevent degradation of the ecosystem, a minimum of sixty percent of Bhutan's total land shall be maintained under forest cover for all time (The Constitution of The Kingdom of Bhutan, 2016. p. 12).

The protection of the environment is therefore one of the main pillars of the GNH concept, which is unique to Bhutan (Tobgye, 2015). Gross national happiness is a philosophy that guides the development of Bhutan and outlines the need to balance material wealth with that of spiritual well-being. This balance is an art of living in harmony with other humans as well as with non-human others. Gross national happiness is a form of economic thinking that is about more than economic development, and the concept prioritises different kinds of futures, where development does not mimic industrialised economies but retains environmental sustainability and cultural integrity. Bhutan provides an example of what Gibson-Graham (2006, p.x) called "a community economy", where economic concerns are negotiated with other ethical concerns in a direct and intentional way. Gross national happiness and how it emerged in Bhutan will be described in chapter two in more detail.

Gross National Happiness has guided the country to some extent, along with consistent societal and governmental commitment to environmental preservation. This has resulted in the real maintenance of 60% forest cover (van Noord, 2010). Indeed, the total forest cover is actually 75.65%, if regenerated scrub forest is included (van Noord, 2010). While the success in maintaining forest cover is indeed impressive, the central argument of this thesis is that there is a need for an even more holistic environmental and economic approach, whereby the entire ecosystem is taken into account. The recent years of managed development have resulted in signs of ecological degradation, especially in terms of water sources in cities like Thimphu, Paro, Phuntsholing and many others. It is worrying to see the rivers in decline, because these waterways safeguard the wellbeing of the people as well as the environment. The recent degradation is especially disturbing because it challenges the principles of GNH, a philosophy that Bhutanese people are very proud of. Emerging from my concern about the status of water sources and rivers in Bhutan, I propose negotiations that can be made to fully operationalise GNH at a grass-roots

level to include rivers. This can be achieved by reconnecting now disconnected human practices with nature, especially in terms of rivers. In this thesis, I explore some of the challenges faced by the policy of GNH in the era of the Anthropocene. I explore the issues through the lens of the Thimphu River in Bhutan.

Bhutan's History in Brief

Most of the world knows Bhutan as a hidden Buddhist kingdom in the Himalayas, and some even call it the "Last Shangri-La" because of its natural resources and beauty (Brunet, Bauer, Lacy, & Tshering, 2001, p.244). But Bhutan is far from Shangri-La. It is a least developed country struggling to achieve the basic minimum living standards, which Western and developed countries have long since achieved. It has an area of 38,394 km^2 and shares borders with China in the North and India in South, East and West (Figure 1). It is a mountainous country, and the terrain is highly rugged, with an elevation of 100 m above sea level (ASL) in the south to over 7,500 m ASL in the north.

Figure 1. Map of Bhutan.

Note: Created by author from Google Earth.

Bhutan is also known as a country that aligns its development goals with the philosophy of GNH. Gross national happiness is a noble concept conceived by the

fourth King, Jigme Singye Wangchuck, in 1987. It was later bestowed upon the Royal Government of Bhutan to be used as a development philosophy (Givel & Figueroa, 2014). The concept of GNH was articulated by His Majesty to indicate that development had many more dimensions than those associated with a gross domestic product (GDP). According to the Bhutanese, development should be understood as a process that seeks to maximise happiness rather than economic growth (Planning Commission, 1999). The evaluation of happiness is based on four pillars, which are: 1) economic growth, 2) cultural preservation, 3) ecological protection and 4) good governance with no corruption (Ura, Alkire, & Zangmo, 2012).

The cultural and political history of Bhutan is characterised by isolation, independence, non-colonisation and values based on traditional roots in Buddhism. This has allowed the nation to develop its own stringent and strong environmental preservation ethics and behaviours, which are embedded in the GNH concept. However, with the inception of planned development in 1961, Bhutan opened its doors to the forces of change and modernisation. Bhutan has been trying to balance the pressures of society, economy, politics, culture and the environment since then.

Despite this balancing act, Bhutan has been facing negative impacts on its environment. The rapid pace of economic development has exerted pressures on the natural environment, and environmental issues are further aggravated by a complex range of other factors like climate change, population pressures, agricultural modernisation, hydropower and mining, industrialisation, urbanisation and infrastructure developments (Alam, 2004). It is these pressures with which we must negotiate and try to adapt to with a view to living well.

The Beginning of Economic Development

All over the world, economic development and population growth have been the main drivers of rapid changes in the functions and structure of freshwater ecosystems over the past 50 years (Liu, Kattel, Arp, & Yang, 2015). From 1970–2000, North America, Europe, Australia and New Zealand have witnessed a 50% average decline in populations of freshwater species (Liu et al., 2015). Freshwater resources in urban areas have been the most affected, with urbanisation leading to intense changes in freshwater ecosystems (Alberti et al., 2007). Globally, urbanisation has altered and changed landscapes, leading to urban sprawl, which has been significant during the last half century and is expected to continue through the

next decades (Alberti et al., 2007). Changes and alterations such as vegetation clearance, soil compaction, ditching, draining and covering the land with impervious surfaces have had negative effects on natural runoff processes, which in turn affect stream ecosystems (Alberti et al., 2007).

The question as to what degree these pressures have been exerted on Bhutan is an interesting one. Due to very recent, rapid economic development and urbanisation in Bhutan, human competition for land, forest and water resources has increased exponentially. Although concerns about the environmental impacts of development have been given higher priority during planning than in other countries, it has been a challenge to actually reduce these impacts (Uddin, Taplin, & Yu, 2007). For example, the capital city of Thimphu is the fastest growing city in Bhutan, and the impact of human activities on the Thimphu River can be clearly seen today in the degraded water quality of the river.

Whilst economic development in Bhutan has caused some unsustainable, exploitative practices in resource management and land use, much has been done in the past few decades to counter these trends. In many cases, concerned communities, partly assisted or led by non-Governmental organisations (NGOs), the Government itself and environmental movements, have created new resource user collectives. In Bhutan, NGOs like Royal Society for Protection of Nature, Clean Bhutan, Greener Water and the Thimphu / Wangchhu Water Keepers have made huge impacts, particularly in cleaning landscapes and in creating awareness about waste management and the conservation of biodiversity. With these groups actively seeking to strike an environmental balance with economic development, it seems it is not too late for Bhutan to recognise humanity's dependence on nature. At the same time, it is possible that the Bhutanese people can embrace some form of modernisation.

In this context, my approach to this research has been to focus on reconnecting to the essence and values of the GNH development philosophy as it was first envisaged by King Jigme Singye Wangchuck in 1987. Thus, my aim is to explore how we might reconnect to the founding philosophy of GNH, which is about interdependence and interconnectedness. Secondarily, I aim to explore how we might honour and respect natural resources like rivers and forests, thereby protecting them. My focus is the Thimphu River, a river that flows through the capital city of Bhutan. I have approached my research firstly by exploring the behaviour and practices of

communities living beside the river, and secondarily, by studying local perceptions of the river.

The Research Problem

Bhutan has been influenced by globalisation and now faces the same environmental pressures that have given birth to the age of Anthropocene. The ever-growing urbanisation, coupled with the influences of modernisation with which comes consumerism, is illustrated in cities like Thimphu, Paro and Phuntsholing. It is also clear that human activities have fundamentally undermined the beliefs in human interdependence with nature, the core foundation of GNH. To what extent this kind of urbanisation impacts Bhutan's GNH philosophy and the lives of the humans and non-human others is unclear, however. "Non-human others" as a concept is drawn from the ideas of ecofeminist philosopher the late Plumwood, who reminded us that the non-human world has meaning, values and ethics (Rose, 2015). Herein, I argue that this idea of valuing non-human others is well-aligned with the worldviews of Buddhism, Bhutan's main religion. Buddhist insights on interdependence are about how the triad of values–intentions–actions (aka *karma*, or cause and effect) shape life patterns, outcomes and opportunities (Herschock, 2004). The belief of interconnectedness with all living beings and believing in love and compassion for all sentient beings is the basis of Buddhism in Bhutan.

However, despite strong beliefs in interdependence, a significant challenge exists in Bhutan. These challenges, especially in regards to maintaining adequate water quality for all living things, are becoming big issues. There is a huge misconception in the minds of the people. Most people think that the rivers are still clean because there are forests on the mountains protecting the rivers, regardless of harmful activities humans carry out near the river. The Thimphu River today has thus been ignored, and at the same time exploited, by many users. The challenge is to ensure that communities have adequate access to clean water for drinking, sanitation, agriculture and for commercial purposes, without disrupting complex aquatic ecologies. Even if we look at the issue purely in economic terms, reduced water resources in Thimphu could have negative impacts on hydropower plants downstream, which are the main economic driver for Bhutan. It has thus become important to understand how people make sense of and relate to rivers, watersheds and aquifers, and to find out how we can live well with the river.

The future of the Thimphu River, an exemplar of Bhutan's other freshwater resources, represents a major test for the philosophy of GNH. With the current state of the Thimphu River and the challenges it is facing, the research question I address in this thesis is how we as Bhutanese people can survive and live in harmony with the Thimphu River.

My Personal Commitment

Many events spurred me to write this thesis. These eventually led me to New Zealand to study for a Master degree in Water Resource Management. I have always been concerned about the environment, which led me to participate in *Eco Pad Yatra* (in Sanskrit, *pad* means foot and *yatra* means journey; *pad yatra* therefore means "journey on foot"). According to His Holiness Gyalwang Drukpa, the spiritual leader of the Drukpa Kagyu version of Tibetan Buddhism, walking on earth helps us to build a genuine relationship with nature thereby connecting to it (Drukpa Publication, 2014). So, I walked. My walk started in Bumthang in Bhutan. I journeyed with 70 other pilgrims, and we walked for 2 weeks, picking up litter on the way. It was very upsetting to see all kinds of litter, including plastics of all kinds and used sanitary napkins. Even in the remotest parts of the country, we could see what we as humans were doing to nature. Just as Cameron, Manhood, and Pomfrett (2011) described the way in which community gardeners learn to be affected by the human and nonhuman world around them, we as pilgrims were also "learning to be affected" by picking up litter. Although the pilgrimage was an act of meditation as well as self-transformation, finding litter in what we called pristine places disturbed me. This experience transformed me in some ways, because every time I go for a walk now (even a day walk), I end up picking up litter on my way back home. I have become sensitive to the wastes and litter that I see. Even though my personal journey is different from the community gardeners' "journey" as described by Cameron et al. (2011), I feel that my experience from the walking pilgrimage was also a form of cathartic learning, or learning to be affected.

After my *Eco Pad Yatra* experience in Bhutan, I wanted to do more for the environment, which led me to apply to study water resource management in New Zealand. During my study, I had the opportunity to take a course on environmental perspectives, which I found very interesting and relevant to my thesis. This course had a role-playing part where I had the opportunity to play the role of the cultural

planner for the Avon / Ōtākaro River project, currently ongoing in Canterbury, New Zealand. While doing the assignment in a group, I read about the Avon / Ōtākaro River, and the policies and related water management issues in wider New Zealand. I found some similarities in the cultural values placed on water by the South Island iwi of Ngāi Tahu (for example healing powers and sacred values of water) with the values held in Bhutan. Iwi also had an interesting idea of giving the legal status of personhood to a river called the Whanganui River because the river is understood to be the ancestor of the local Wanganui iwi (Roy, 2017). This concept really fascinated me, because I found it similar to the way the Bhutanese people value springs and lakes for their healing, sacred and spiritual values.

Being born in the City of Thimphu, I have a personal connection with the environment of Thimphu. In the past few years, I have noticed that the Thimphu River has been severely impacted, and the river's health is degrading. As a child, I grew up playing near the river, which made me think that all rivers in Bhutan must be as pristine and as clean. Now, as a research student visiting the same site, I see that the situation has changed completely. Thus, to me, it is clear that there is an urgent need to take immediate measures to prevent further damage to the river. I started questioning the behaviours and practices of our own people that are not in line with our professed principles of GNH, which is considered as a "living example of an alternative approach to progress" (Adler, 2009). I believe the Bhutanese people, and particularly the communities in Thimphu, need a reminder to act according to the values and principles of GNH.

With the clear notion of how I could contribute to improving the Thimphu River environment for humans and non-humans alike, my objective was to study how people in Thimphu perceived their river. My supervisor introduced me to the book *Take Back the Economy: An Ethical Guide to Transforming our Communities* (Gibson-Graham, Cameron & Healy, 2013), and henceforth, my interest in "community economies" grew. What Gibson-Graham et al. (2013) termed a "community economy" involves intentional negotiations by a group of people about:

- necessity,
- surplus,
- consumption,
- transactions,

- commons, and
- investment.

These concerns are negotiated with full recognition of the non-capitalist aspects of community wellbeing and exchange. This negotiation aligns with the values and principles of GNH, which strives to balance the spiritual and material aspects of life between *gakid* (happiness and peace) and *peljor gongphel* (economic development) by focussing on the wellbeing of the people. For me, Gibson-Graham et al. (2013) were looking for possibilities in striving to live sustainably with non-human elements that support human existence. The concept of GNH is also about striving for the same balance of the spiritual and material, known to Buddhists as the middle path. The common thread between the two concepts is a redefinition of value: the idea of surviving well together with the planet as opposed to making only a profit. Thus, GNH can provide a way of rethinking values through negotiating the key concerns of community economy.

In the case of the Thimphu River, I have questioned the nature of environmental preservation and have asked to what degree negotiating GNH could create a community economy scenario in Bhutan that would allow for sustainable use of the river (Gibson-Graham et al., 2013). Although conservation and resource management policies have been successful in Bhutan, they have usually focussed on forests and nature at a broader level. There are successful forest user groups in many parts of Bhutan (Buffum, 2012), and also strong human connections with the forests, which are said to be home to local spirits or deities (Allison, 2002). This has resulted in good practices of forest management in various parts of the country.

However, management of water in Bhutan is different. While much focus has been on water supply in a specifically urban context, the emphasis has been less on the role of the Thimphu River itself. People dispose of solid wastes and trash directly into their rivers, which has degraded water quality, particularly in areas with higher population densities. Seemingly, spiritual connections with the river have been lost in cities. Thimphu River, or any other urban river, is in need of proper care. My question has been whether the people of Thimphu can perform the same actions that made forest user groups successful in valuing Bhutan's forests as a common resource. In Australia, the Aboriginal people in West Arnhem Land have broken down the distinction between "yours and mine" and "you and me" by making and sharing

"commons" (Gibson-Graham et al., 2013). Breaking down this distinction might be possible for the people of Thimphu.

In my role as an agricultural engineer and working in a Government agency in Bhutan, I have experienced some of the top-down approaches used in the creation of policies, and I see a need for meaningful bottom-up participation of communities in making the policies work. I have always asked myself what the result would be if we incorporated more community perspectives into Government policies, because communities are directly affected and are in daily contact with the problems policies seek to regulate. In this thesis, I suggest that a bottom-up approach might lead to better co-management of the Thimphu River. To achieve a successful bottom-up approach, however, we must understand and explore how local people relate and connect to the Thimphu River.

The Christchurch node of the Community Economies Research Network (CERN) has been the site of learning encounters with colleagues using post development theory and with an interest in the theoretical project of the Community Economies Collective, a group started by J. K. Gibson-Graham and a number of other academics, including my supervisor, Dr. Kelly Dombroski. In the Christchurch node of CERN, we have had discussions about post development theories, where individuals and communities can reconsider their roles in the economy and what they can do to make a difference in their community, beyond commonly accepted capitalist economic development. Although I will not go into the theories of post development in depth, I want to make it clear that these discussions with my supervisor and colleagues have made me reconnect and appreciate the concepts of GNH. I feel that these concepts have emerged from the intellectual traditions of my own country, rather than being a Western framework for what a good life might look like. Our discussions were a stark reminder to me that the concept of GNH is worth investing in, and discussions have raised my enthusiasm for using this uniquely Bhutanese concept to approach the issues of conserving the ecological and spiritual values of the Thimphu River.

In this context, I have considered whether negotiating GNH as a community economy could bring in positive changes for better urban rivers. Gibson-Graham et al. (2013) noted that a community economy is not a blueprint, but is rather "a space of decision-making where we recognise and negotiate our interdependence with other humans, other species and our environment" (p.xix). Drawing on to this description, I

investigated GNH as a community economy, a space for decision-making, and a space for negotiating six ethical concerns:

- surviving well,
- distributing surplus,
- encountering others in surviving well,
- consuming sustainably,
- caring for commons, and
- investing in futures (Gibson-Graham et al., 2013).

Although all of these key concerns of a community economy seem to be applicable in my study, herein, I investigate encountering others and taking care of our commons only. Gibson-Graham et al. (2013), like other authors on commons concepts (e.g., Cameron et al., 2011; Roelvink and Gibson Graham, 2009 Rose 2015), approached the concept of commons as a verb, asking how might we work to "common" those resources that are important to groups seeking to survive well, or thrive. It seemed to me that this concept of "commons and commoning" in a community economy is a useful way to approach the task of reconnecting the people of Thimphu with resources such as rivers. And more than this, it is possible that this connectivity can serve as an organising framework for understanding river–city interactions, improving the relationship between humans and their rivers, and informing the increasingly widespread efforts to restore urban rivers, both in Bhutan and elsewhere. Thus, in the following section, I explain my research objectives in this light.

Research Objectives

My goal was to find appropriate means and methods for the people of Thimphu and the Thimphu River to thrive. To accomplish this, I formulated specific research objectives. These were as follows:

1. To understand and explore the connections between local communities and the Thimphu River;
    a. by investigating the physical status of the river and human–river connections;
2. To study the perceptions and attitudes of the local community towards the Thimphu River; and

3. To explore and contribute knowledge to the social relationships and linkages between local communities and the Thimphu River.

Research Overview

The general aim of this thesis is to find appropriate ways for humans and the Thimphu River to survive and live well together. Chapter one describes my personal interest and research problem, and elucidates my objectives. I also provide a background history of Bhutan. In the following chapters, I provide the context and history of how GNH emerged in Bhutan, and then I show how the concept needs to be negotiated for improvements in water resource management to occur at a grass-roots level.

Chapter two describes the development process in Bhutan and explains the history of its development. I illustrate the struggles and challenges faced in balancing a materialistic approach and spiritual values in a world that has strayed away from interdependence, a departure reflected in water management in Bhutan. In chapter two, I show how GNH is not working in the case of water management, especially in regards to the Thimphu River. I also briefly explain what water management in Bhutan could be like if people were to reconnect with their spiritual values.

Chapter three explores in depth how GNH emerged from the indigenous knowledge of interconnection with nature and environment. I describe how Western knowledge and science have colonised our minds and have led to the disconnection of people from nature. I also illustrate how and why a decolonising methodology was appropriate for answering the research objectives of exploring the existing connections and perceptions of local communities towards the Thimphu River.

Chapter four explores the existing connections of communities with their river. I describe the materialistic approach towards water management, and I define what spiritual values still exist. I also discuss the current disconnections between the river and its surrounding communities.

These disconnections have had consequences on how communities perceive the river, which is described in chapter five. In chapter five, I answer the research objective of understanding the attitudes of communities towards the Thimphu River. I explain how perceptions have evolved according to existing connections. I also note that present management is not enough to preserve the Thimphu River, and I explore how I would revive traditional values.

Chapter six is a detailed discussion about different methods I would use to reconnect communities with the life-sustaining waters that are the Thimphu River. This chapter answers the third research objective of contributing knowledge to the relationships between the river and local communities. I find that GNH offers one approach, but it is not sufficient. Negotiating GNH is necessary. To negotiate this concept, I propose that the ideas of "taking care of the commons" and "encountering others" could be used to reconnect water users with holistic values, which are a prerequisite for being successful in conserving the health of the Thimphu River.

Chapter seven is a summary of the study's key findings. The chapter provides an overview of how the research objectives were achieved. In chapter seven, I offer recommendations for improving the status of the Thimphu River and how one as an individual or collective can reconnect to the concepts and principles of GNH.

Chapter Two: Balancing Materialism with Spiritual Values

Bhutan still has what most countries have lost in pursuit of material comforts. For decades, people in Bhutan have lived a simple and sustainable life in harmony with its pristine environment. They have enjoyed strong families and social systems. In the past, subsistence farming supported a relatively simple, yet comfortable living. Although the Bhutanese society was nowhere near perfect, people in it learnt a resounding lesson from both developing and developed countries: preservation of its sustainable way of life at all costs. It was clear to the Bhutanese that in the pursuit of material comforts, many countries had lost their cultural identity, their spirituality and had upset the ecological balance through environmental degradation (Dorji, 2005). Changes could threaten all these things in Bhutan, and therefore, the survival of the country was at stake (Dorji, 2005).

Bhutan's response to modern Western ideals has been unique. It took a lot of experiences for leaders like the fourth King of Bhutan to come up with a very strong philosophy for development, which was an alternative to the global development paradigm. Many traditional Bhutanese religious and traditional beliefs are intact within the GNH concept. The key feature of GNH is the way it reframes the economy by linking it more directly to the wellbeing of the people and the environment, and not only to material outputs. However, imbalances began with Bhutan opening its door to the world in 1961. Then, Bhutan experienced rapid development, which had an enormous effect on its environment. With Bhutan opening up to the world, culture, traditions and the environment were challenged by other values of consumption and individualism. People started leaning more towards material rather than interpersonal growth (Adler, 2009). There was a high tendency for the Bhutanese to homogenise with the rest of the world, which contradicted the ideological, emotional and psychological foundations of the country (Mancall, 2004). The intellectual capacity of Bhutan's policy makers was also influenced by Western theories and practices. It was, and still is, impossible to avoid the global forces for change.

Bhutan, a country of just 700,000 people, was vulnerable in 1961, and thus, it was appropriate for authorities to put economic self-reliance first to be able to grapple with the inevitable process of change (Dorji, 2005). However, the increase in tourism and the growth in information technology have resulted in the rapid increase of some consumer groups' demand for foreign goods (Mancall, 2004). This has become a direct threat to the goal of economic self-reliance, because Bhutan's resources are

limited (Mancall, 2004). Given the country's own need and desire for electricity, and the opportunity for Bhutan to sell electricity to neighboring countries like India and Bangladesh, it seemed during the 1960s that environmental, spiritual and social concerns could not receive priority consideration.

Gross National Happiness

Gross national happiness, developed in response to globalisation, is described as a potential alternative to the mainstream global approach to development. Today, GNH rests on four pillars, which are:

- equitable economic development,
- environmental preservation,
- cultural resilience, and
- good governance.

These pillars are based on traditional Buddhist views and values. The values include respecting other humans and non-human others. A core tenet is the Buddhist interpretation of nature as a living system rather than a resource base or commodity that is there to be exploited for material gain (Uddin et al., 2007). There is evidence that the GNH concept, based on these traditional Buddhist values, has worked to date, especially in terms of preserving natural resources, particularly forests, and in the fields of education, culture and the preservation of traditions.

Broadly speaking, GNH encourages a culture of harmony and compassion, also central to Buddhism as practiced in Bhutan. Thus, GNH is expected to balance human and non-human values and development, thereby meeting the material, social and spiritual needs of the human being. Similar to the statement made by Gibson-Graham (2005, p.6) about community economies as "imagining and practicing development differently", GNH is also about the same practise. The Bhutanese people believe that gods, spirits and demons live in the high mountains and deep ravines, and in ancient trees, rivers and rocks. If one disturbs these elements of nature, the resident spirits will be enraged and will bring ill luck, sickness and death to those responsible and their families. In contrast, by appeasing these spirits through cleansing rituals and proper care, people are rewarded with luck, peace and prosperity (Ura, 2004). To date, these beliefs and values have played a significant role in

creating conditions that have had positive impact on local culture, society and the environment.

In line with the indigenous narratives existing in Bhutan, the Aboriginal peoples' narratives are linked with spiritual and traditional ways of life that have led them to associate the Murray River as a force that created life (Weir, 2009). For them, the non-human other is the river, which has to be treated with respect. However, in Australia, spiritual beliefs and values gave way to modern thinking, where water became just a resource to be stored, regulated and allocated for human consumption. The flowing rivers were liquid gold that supplied an economic resource — water — for large-scale agricultural production; country towns have thrived since the introduction of modern agriculture to Australia (Weir, 2009).

However, this approach and the Western science worldview overlook spiritual connections and define the natural world as morally inert (Rose, 2015). From a modern thinker's perspective, traditional narratives and the nation-building narratives cannot co-exist: one must be sacrificed for the other. However, it has been argued by Weir (2009) that this way of thinking is false in the case of the Murray-Darling Basin, and that the connections sustained by water involve water for production and water as an ancestral life force. Likewise, many Western initiatives and scholars are beginning to give more attention to the social and ethical dynamics of conservation. This paradigm shift is similar to the existing philosophy of GNH, which states that Bhutan should pursue a balanced, or a middle-path, development strategy based on the belief that moderate consumption leads to the realisation of true wellbeing (Rinzin, Vermeulen, & Glasbergen, 2007). In other words, GNH principals state that spiritual and traditional perspectives can co-exist with modern nation building. However, the challenge is to see how much further Bhutan can proceed with the GNH approach and still avoid environmental degradation. The balanced, or middle-path development strategy is already being challenged. Bhutan is experiencing a far-reaching societal transition and is changing from a rural society based on subsistence farming to a society with growing metropolitan service and industrial sectors (Rinzin, Vermeulen, & Glasbergen, 2007).

Water Resource Management Challenges

It was not very long ago when the Thimphu River was a pristine and ecologically healthy river. Today, this river and other rivers in Bhutan carry water

that is reduced in quality due to human activities and solid wastes disposed in their waters. Rapid human population growth in both urban and rural areas is increasing the pressure on available water resources. Intensive cropping, commercial-scale animal husbandry, industrial complexes and increasing domestic demand have escalated the issues. However, climate change brought on by global warming will most likely be the biggest threat in the coming decades (Dorji, 2016). Water is a finite resource, and its scarcity is becoming more evident every day. Bhutan is vulnerable to climate change and must deal with glacial lake outburst floods (GLOFs), which will eventually lead to streams and lakes drying up. These water sources are used for irrigation, drinking water and industries such as hydroelectric power plants.

With the increase in consumerism and the influence of Western media, the notion of "water as a commodity" has become stronger. Thinking of water as a commodity, or as a resource for exploitation, does not address over-allocation of water, but instead, ensures more efficient consumption of water, leading to the degraded states of rivers (Weir, 2009). In Bhutan, the balance between traditional or indigenous approaches has been shaken, and the modern approach where commodification is prioritised has crept into GNH thinking. In most of the country's Government reports, the focus is mainly on income, or water as a commodity. For example, the Dorji (2016) report states that freshwater is the main income-generating source for the country and is used for hydropower generation, which is exported to India. The report also states that water is essential for agriculture, and agriculture is the means of subsistence for over 60% of the population (Dorji, 2016). The Bhutan Water Act, enacted in 2011, identifies integrated water resource management (IWRM) as the preferred Government approach to protect, conserve and manage water resources in an economically efficient, socially equitable and environmentally sustainable manner (Dorji, 2016); however, this Act lacks a guiding policy. This lack has resulted in gaps and duplication of efforts in managing water. Indeed, public awareness of the Water Act is extremely low (Dolkar et al., 2013). Compounding the issues, the profound and intimate values of water are lost with the focus being on production and income generation. Water management in Bhutan has clearly embraced the modern conceptualisation of water as economy.

In the midst of all the modern activities associated with the commodification of water, it has become easier to forget traditional and cultural connections with water. At present, human connections with water sources and rivers in Bhutan are based on

water as a commodity. If no action is taken to reverse this trend, it is possible that the impacts of ecological destruction will lead to the loss of opportunities to connect and reaffirm relationships with the river, leading to further degradation and other unseen dispossession. This has happened, for example, in the Murray-Darling Basin, where the change in access to the river has caused a new wave of dispossession (Weir, 2009). This could easily happen in Bhutan, or may already be occurring.

Based on the Australian example, it is important not only to recognise the economics of water by maximising monetised activities like hydropower generation, mining or irrigation for agricultural production, but it is also essential to recognise the economics of community-making by negotiating societal ethics and quality of life (Gibson-Graham & Miller, 2015). In other words, by recognising and accounting for spiritual, traditional and cultural connections, which are on the verge of losing their meanings and purpose, the Bhutanese people can create a new economic space for negotiation. Therefore, I argue that we as Bhutanese can revive and reconcile the happiness we associate with cultural survival and environmental wellbeing by reviving the connection that we have had with our rivers. These connections are profound values, which I refer to as spiritual values.

Water Management and its Spiritual Values

Water assumes a variety of roles for different communities in Bhutan. Some communities consider water as holy and as a source of strength, while others consider water as a cause of destruction to life and property. Thus, water is managed differently according to how it affects the lives of people in different communities.

In Bhutan, water uses vary from offering water in shrines to cleaning, washing and other domestic uses. Most people in communities around the country still have the traditional and spiritual belief that rivers have self-cleansing or self-healing properties. Narratives around different rivers that are spiritual are characterised by minimal human interference that exist in many small communities (Ura, 2001). These narratives give meaning to life for many communities. For example, in Trashi Yangtse, which is one of the remotest areas in Bhutan, people believe that deities are the spiritual owners of natural resources like mountains, trees and rivers. Thus, natural resources originating from within the citadels of deities are off limits. Within citadels, trees grow to a great size and water springs are undisturbed (Allison, 2002). Such beliefs form a profound ecological stance and are recognised as interdependence

and reciprocity in the promulgation of GNH. These beliefs give meaning to the non-human world (Plumwood, 2007; Rose, 2015) on which the GNH was founded.

Furthermore, water is considered pure and is used for many religious purposes in Bhutan. The religious uses of water are for offerings, cleansing after birth, death and consecration ceremonies. As Buddhists, most Bhutanese households and monasteries offer water known as *yoencha* locally, in front of their shines every morning, with a view to developing generosity and compassion for all sentient beings. In monasteries, water is usually placed in a ritual vase known as a *bumpa* and is mixed with saffron. The mix is offered to visitors in small amounts after ceremonies to drink and purify. Water in the *bumpa* is considered holy and is used to cleanse new-borns and also to ward off negativities. Such water use practices are exemplary in maintaining consciousness about the importance of clean and fresh water. In addition, some springs and streams are known for their medicinal values, and they are called *tsachhu* and *menchhu*. These waterways are considered to be blessed and to have healing powers, which cure a number of sicknesses. Rivers are also considered important in Bhutan for burial purposes, because clean water is the final resting place for the ashes of cremated bodies.

However, over the years, some of these beliefs and values have been waning, especially in urban areas. This is occurring rapidly in Thimphu, and the brunt of the change in values is being borne by the river. Paradoxes between beliefs about water use can be seen in daily practices. Although water purity and its cleansing qualities are sacred things in individual households and monasteries, this belief is forgotten when it comes to the quality of water in rivers. The source of water used for offerings, ritual *bumpa* ceremonies and the water running in the taps of all households are the same. The water is mostly untreated and is sourced directly from the rivers and springs. Yet, when it serves our purposes, we treat the same water and the river as a drain or dump. We perceive water differently according to how we use it, even though it is the same water. Thus, even when the river is considered to be a citadel of a deity or a domain of *tshomen mo* (a mermaid, largely considered as the owner), people have started to overlook these connections and have continued to pollute the river. This is occurring in Thimphu on a daily basis. Spiritually, the river is considered to be an offering to the founder of Bhutan, "*Zhabdrung Ngawang Namgyel*", but people still drain their wastes directly into the river. The *tsachhu* and *menchhu* of medicinal values flow into the rivers, yet the quality of the water in the

river is degraded by human activities. It seems that in Bhutan, we value and respect the dead and believe that their ashes have to be rested in clean water, yet we fail to keep our water and rivers clean.

It seems that consumerism is surpassing spiritual values of nature and how such values are reflected in water resource management. I have described how overly materialistic approaches have challenged GNH and have also challenged water resource management in Bhutan. However, another line of thought suggests that the spiritual values that bind communities with water can be tapped to achieve the goal of restoring rivers, because rivers have fundamental connections to human processes. However, the impacts of globalisation on indigenous Bhutanese knowledge and culture are severing people's connections with nature. Therefore, it is important to reflect on the traditional and indigenous knowledge of local communities and to know them before they are lost completely. I describe my approach to regaining indigenous spiritual knowledge in the next chapter.

Chapter Three: Knowing Ourselves

Surviving well with nature was not a big issue in Bhutan until recent times, when the country witnessed a major socio-economic transformation and rapidly growing per capita income. Yet, the skills for living well together with nature, based on reverence, responsibility, reciprocity, respect and valuing the relationship are still evident in traditional practices used by our elders in Bhutan. According to Sepie (2017), traditional and indigenous ways of life have been the human's guide to living well on the planet. Sepie (2017) has argued that traditional ways of life are about understanding the nature of the human being, other species, the planet we share and how to co-exist peacefully. All these belief systems constitute an integral part of cultural identity and social integrity (Sepie, 2017). In Bhutan, this is no different. The traditional way of life includes a code of conduct known as *driglam namzha*, which is distinctly Bhutanese (Rinzin et al., 2007).

Bhutanese traditional knowledge embodies experiences of nature gained over millennia from direct observations, which are then transmitted, most often orally, over generations. Indigenous knowledge is herein defined as a cumulative body of knowledge and beliefs handed down through generations by cultural transmission about the relationships of living beings (including humans) with one another and with their environment (Gadgil, Berkes, & Folke, 1993). The importance of this indigenous knowledge for the protection of the environment and the achievement of sustainable development is slowly being recognised internationally (Gadgil et al., 1993). However, with globalisation, traditional peoples are becoming more absorbed by the global economy, with trade, acculturation and population pressures, leading to isolation or detachment from their own restricted resource catchments. This process leads to a loss of motivation to continue practicing sustainable uses of a diverse range of local resources, along with the loss of pertinent indigenous knowledge (Gadgil et al., 1993).

One of my research questions is about finding ways to survive well with the Thimphu River. Therefore, it was essential to use an appropriate methodology to find appropriate ways of knowing the river. I realised that it was essential to relate the methodology to our culture, which is rooted to our traditional knowledge and belief system. This section provides a general discussion on discovering ourselves through the indigenous knowledge system. I also discuss the influences of globalisation on Bhutan and its indigenous knowledge.

Knowledge as I Know it

Bhutan was never colonised physically by any country, yet there are many Western influences in the areas of knowledge structure and educational systems in Bhutan. In fact, Western knowledge and science are the beneficiaries of the colonisation of indigenous peoples (Smith, 2012). "Knowledge gained through colonisation has been used in turn to colonise other people in what Ngugi wa Thiong'o called a colonisation of the mind" (Smith 2012, p.131). Smith (2012) further argued that such misappropriation of knowledge reaffirms the West's view of itself as the centre of legitimate knowledge, the arbiter of what counts as knowledge, and the source of "civilised" knowledge. Thus, due to this globalisation of knowledge, the knowledge systems in Bhutan are now mainly based on Western knowledge and science "introduced from the West, by the West for our benefit for which we should be duly grateful" (Smith, 2012). This was, and still is, counted as true knowledge in our Bhutanese "colonised minds".

Without ever having been colonised, colonial education still plays a very important role in the educational system in Bhutan. Many schools with a Western understanding of education have come into being since the 1960s, when Bhutan opened its doors to the West, and some of Bhutan's elite groups have been sent to study Western knowledge and science in other countries especially in India. Even today, in almost all of Bhutan's schools, the medium of teaching is English, and speaking good and fluent English is still considered essential for an educated person.

In the 1960s, when development activities first started in Bhutan, the decision makers who initiated the development process were mainly expatriates[1] (Penjore, 2013). There were only a few local leaders who participated in framing policies and in designing projects. Bhutan's experience was similar to the experience of the Solomon Islands, where the decision makers in rural development were mainly expatriates designing policies and projects, while the islanders where labourers,

[1]Examples of expatriates (many were from India but few most reknowned are):

1. Dasho Keiji Nishioka was a Japanese agricultural expert who came to Bhutan in May 1964 and helped the country modernise its agriculture.
2. Father William Mackey was a Canadian who came to Bhutan in 1963 and started Western education in Bhutan.

consumers and observers of the services provided (Gegeo, 1998). This process of development, where indigenous knowledge was not acknowledged, led to projects and policies getting designed according to what the expatriate colonial leaders presumed to be best for the Solomon Islands under the model of the British Empire, and not according to the needs of the villagers; as a result, most of these projects failed (Gegeo, 1998). However, for Bhutan, the acknowledgement of indigenous knowledge in its development philosophy emerged at the right time for success to occur.

"*Yargey gonphel*" directly translates as "development", and these words seem to be spoken by every individual Bhutanese because of the changes and the impacts that can be seen everywhere. The idea of development in many minds of the Bhutanese, including myself, is the "creation of a material basis for good life" (Ura, 2005, p. 1), which stems from the colonisation of our minds. This so-called good life includes access to roads and bridges, good houses, comfortable and easy lives and improved living standards. To some degree, life in Bhutan has become easier and more comfortable compared to how it was before the 1960s development activities started. People now feel thankful for the efforts of the Government in pursuing development and aiming to achieve economic self-reliance. However, in the process, unintended side effects have occurred.

Ura (2005) described a Western standard of development, which is measured in terms of per capita income, levels of material possession and consumption. Clearly, this concept of development was not the vision for Bhutan's development in its original format, however. In 1998, Lyonpo Jigmi Thinley, then Prime Minister of Bhutan, said,

> While we accept the reality of globalisation and cultural change, we can always endeavour to select the most beneficial aspects of it. To make the correct choice is our greatest present and future task and we believe, very profoundly, that every country must take up and confront the challenge of increasing human happiness boldly and creatively (Dorji, 2004, p.8).

In Bhutan, decision makers hoped to balance globalisation by localising decisions and by extracting the beneficial aspects of globalisation and what was relevant for domestic conditions. It is still up to the Bhutanese to take advantage of what the world has to offer, but the current task is about making correct choices. Herein, I

argue that in the process of making these choices, we should not forgo valuing and acknowledging our indigenous heritage, which I describe in the next section.

From Indigenous Knowledge to Gross National Happiness

In the "Knowledge as I Know it" section, I have argued that it is Western logic and science that currently count as "knowledge" in Bhutan. In addition, however, the Bhutanese draw on indigenous knowledge, from which GNH emerged. Indigenous knowledge is more of a life-style than a set of traditional skills and know-how. It may not so easily be transferred to other socio-cultural settings. The indigenous knowledge on which GNH was founded is rooted in the principles of the country's religion, Buddhism, with its focus on compassion, contentment and calmness. Knowledge, according to the Buddhist, is about a deep personal insight into the real nature of one's personal existence, which is gained from the perspective of one's own living experiences. The knowledge that one seeks is not facts and science, but is personal wisdom and insight, which has the power to transform one's life. From this perspective, the narrative of GNH is one of attaining spiritual as well as worldly enlightenment, as opposed to a Western definition of "happiness", which is often consumer-based and reliant on economic development (Brunet, Bauer, Lacy, & Tshering, 2001). Thus, knowledge in the Bhutanese perspective is said to emanate from the Buddhist notion of overcoming the "desire for consumption and acquisition". This challenges the Western ideal that increasingly focuses on economic values, which are used to develop new technologies, new products and new services, leading to economic growth and personal wealth creation (Brunet et al., 2001).

In its description, GNH is about social wellbeing, not just material goods. Social wellbeing includes spiritual and emotional wellbeing, which is beyond the accumulation of wealth. In other words, in the official language of Bhutan, Dzongkha, social wellbeing is known as *deljor*, a combination of two words, *delwa* and *jorpa (delwa*, meaning freedom and happiness; and *jorpa*, meaning wealth). Put together, these two words mean that accumulation of wealth (*jorpa*) appears hollow if all human effort is concentrated in its pursuit, leaving little freedom (*delwa*) and happiness (*delwa*, or *ga kid*) (Ura, 2005). In short, the pursuit to happiness (which according to Buddhist beliefs is a state of mind) does not come from accumulation of wealth or materialistic gain. The concept of GNH was developed specifically to reflect Bhutanese values and culture, integrated with indigenous knowledge, which is

also a way of life used to measure what people in society care about (Adler, 2009). As Buddhists, people in Bhutan respect all living things, which means they are more predisposed to adopt ecologically friendly strategies. This, combined with Buddhist beliefs, which state that the acts of this life will be rewarded or punished in the next life, provides a powerful motivational principle for sustaining Bhutan's natural resource base.

While there are challenges in that people are now leaning towards materialistic want on the one hand, people also care about the nonhuman others and environment on the other hand. The Government's concept of GNH does not discard modern, economic development or knowledge, but happiness that springs from the Bhutanese way of life and indigenous knowledge take precedence over economic prosperity. In short, GNH embraces the Western knowledge system while following the tenets of indigenous knowledge and the Bhutanese way of life, thus maintaining the balance between economic development and true happiness.

This balancing act has become very important worldwide, and countless indigenous nations have engaged in traditional ecological management strategies that acknowledge humans' responsibility for, and humans' dependence upon, the natural world (Sepie, 2017). Many traditional, indigenous worldviews have different narratives that humans conceive of as instinctual and intuitive, which are part of a complex web of ecological relationships (Sepie, 2017). For example, in Australia, Aboriginal cultures of land and place are based on two axioms: the land is the law; and you are not alone in the world. These two axioms guide Aboriginal ethics and practices of connectivity. They require all living things to recognise and to submit to the law of the living world, situating humanity as an equal participant in a larger living system (Rose, 2015). Weir (2015) has argued that indigenous people have inherited knowledge traditions from their ancestors about how to live in Australia. The place (or the country) is much more than just territory; it is where knowledge comes from. Place is where the rules for existence and many of the relationships between species and humans were established by ancestral beings. This is a holistic knowledge tradition, which emphasises connections, respect and mutuality. Scholars have argued that all such indigenous knowledge, although framed by different narratives, recalibrates our ethical relations with each other, and with other life on earth (Plumwood, 2007; Sepie, 2017; Weir, 2015).

The indigenous knowledge specific to Bhutan is about revering nature as a source of life, and it is recognised in the GNH philosophy. However, it is on the verge of waning completely because the peoples' minds are colonised minds, a type of colonisation clearly evident in the degraded state of the Thimphu River. My answer to the research question about how to survive well with the Thimphu River is to revive the connections that we have shared with our natural resources, and especially with the Thimphu River. For this purpose, I use the decolonising approach.

Decolonising Our Minds

Being born in Bhutan, the indigenous knowledge embedded in GNH, which is deeply rooted in Buddhist values, is also rooted in me. Yet, with the education that I received from school teachers about Western knowledge and science, I can say that I possess the knowledge of both worlds. The intersection of these two knowledge bases is sometimes very challenging when they contradict one another (Smith, 2012). This conflict also occurs in GNH, which combines both Western and Bhutanese aspects. The fact that the concept requires quantification and measurements has sometimes made GNH unrecognisable, even to the Bhutanese themselves, because values and beliefs in Buddhism cannot be quantified. Thus, the colonial education offered by Western knowledge and science has impacted not only the individual in Bhutan, but also the concept of GNH itself. This may perhaps be one of the reasons why the Thimphu River is unhealthy today. Careless behaviour, disconnectedness with nature and materialistic views of the Thimphu River are examples of how we have "derailed" like trains from our indigenous knowledge "track". Thus, to me, it has become important to re-discover the beauty and meanings in our traditional knowledge base through decolonising our minds. Through this process, I do not think Bhutan should play the role of the "dinosaur culture" or go back in time (Brunet et al., 2001), but what is important is to negotiate the intersection of indigenous knowledge with Western knowledge, and to minimise the negative elements that accompany change.

Thus, considering myself as an agent and not as an object of study by non-indigenous people, and considering myself capable of or interested in research and as having expert knowledge about my own country (Smith, 2013), I have undertaken the challenge of decolonising Bhutan. The act of decolonisation is about people who seek to promote and support indigenous communities in their particular struggle

(Smith, 2013). By positioning myself as an indigenous person, and in struggling to think about new ways of doing research or caring for indigenous knowledge and for the Thimphu River, I found the Smith (2013) method of decolonisation appropriate for my research. My approach is supported by other scholars, who have stated that this methodology accepts indigenous standpoints, processes and ways of learning (Bartlett, Iwasaki, Gottlieb, Hall, & Mannell, 2007; Brooks, Poudier, & Thomas-MacLean, 2008; Liamputtong, 2010). I aim to create indigenous research, which allows for indigenous self-determination, indigenous rights and sovereignty, on the one hand, and on the other, a complementary research agenda that assists in building capacity and working towards healing, reconciliation and development (Smith, 2013).

With the influence of globalisation or capitalocentric ideals, in which all economic activity is measured against capitalist concepts (Gibson-Graham, 1996), Bhutan is becoming no different from any other developing country. Consumerism is on the increase, leading to increased competition between its people to improve their living standards. The attraction towards new and comfortable lifestyles, thereby forcing people to seek employment in the market economy, both within and outside Bhutan, is a trending process. This has, to some extent, undermined the ethical values underpinning GNH. The values and beliefs of caring, sharing and respecting other humans and non-other humans are sometimes overlooked, leading to destruction of ecological systems.

Such trends predicate decolonisation. By decolonising, I allow indigenous views, procedures and methods of knowing to be embraced, and these are guided by the values of the very people I am researching (Bartlett et al., 2007; Brooks, et al., 2008). Cultural protocols, values and behaviours are fundamental parts of indigenous methodologies, which must therefore be included in research design and discussion of results (Smith, 2013). Research methodologies and design must be respectful, ethical, sympathetic and useful, and must not involve racist attitudes and practices that are based on ethnocentric beliefs and exploitation (Smith, 2013).

Indigenous Methodology: Acting as an Insider

I have many reasons for using an indigenous approach to the current research. First, the worldview that I have as an individual and also as a collective part of Bhutanese society emerged from both Buddhist and pre-Buddhist philosophies in which the mountains, rivers, streams, rocks and soils of Bhutan are believed to be the

domain of spirits. To respect and to conserve nature and the environment is to revere and to pay respect to the deities who dwell in the natural world. This worldview is the basis of the indigenous approach to social science research (Scheyvens, 2014). Second, "colonising" refers to the process where a foreign settler creates a new colony in a new land, and over time, takes away the livelihood and suppresses the identities of many native peoples (Liamputtong, 2010). Colonisation has resulted in significant loss of culture and ways of life, impacting on the health and wellbeing of local people (Bartlett et al., 2007). Something gets lost in the process of colonisation (Bartlett et al, 2007). The "something lost" for indigenous peoples includes indigenous knowledge and culture (Smith, 2013). Although foreign settlers have not created any new colonies in Bhutan, traditional ways of life and indigenous knowledge systems are on the verge of disappearing. Even though there was no colonisation, the process of "something lost" has already happened. The loss is clearly depicted in how Bhutanese people behave around their natural resources, particularly around the Thimphu River. Yet, scholars believe this lost knowledge can be rediscovered and can be re-applied to the way we lead our lives via the indigenous approach (Smith, 2013).

Third, indigenous communities are effectively involved in research that includes them on their own terms, and are empowered as they are re-informed by indigenous knowledge, values and processes, which encourages self-determination (Smith, 2013). Fourth, positioning myself as being an indigenous person alongside my research subjects, and as a person guided by an intention of developing a meaningful outcome for my own community, I am able to empower Bhutanese communities while respecting their culture and traditions (Brooks et al., 2008). Fifth, according to Scheyvens (2014), reciprocity is an important aspect of the indigenous research approach. Reciprocity must be central to research with indigenous peoples, because reciprocal relationships embody both recognition of the custodians of knowledge, and an awareness of the associated responsibilities born by custodians and the receivers of knowledge (Battiste, 2008). As I intend to share the knowledge I gain and to encourage mutually positive, respectful and beneficial experiences between communities and myself, this approach has proved to be useful in my research context.

Finally, as an insider who has knowledge about the values, beliefs, culture and traditions, and as a person who knows the ways of maintaining relationships with

participants, I felt that the indigenous approach was appropriate. However, even as an "insider", I adhered to research ethics procedures and conduct when collecting data. This was another reason for using a decolonising, indigenous approach: such an approach guided me to uphold the highest ethical standards in my research.

Ethics Considerations

Ethics considerations for this study were also a way of pushing the aspects of value and respect for participants in the study to the forefront. For me, ethics considerations meant taking into account participants' needs and concerns. Like Banks and Scheyvens (2014), I felt that the research process must ensure the participants' dignity, privacy and safety, and must give back to them in some ways. As my approach was from the indigenous perspective and my research was with indigenous communities, I felt it was important to take into account "ethics from the bottom up" (Banks & Scheyvens, 2014). It was morally right for me to be considerate of the needs, concerns and rights of participants, as it enabled them to act in a more sensitive and respectable manner in return. As a result, a mutually beneficial relationship was built between me and the individuals from communities participating in the study. Any researcher should follow research and cultural protocols appropriate to the communities concerned to ensure that the research is of value to those who give up their time to participate. In addition, researchers should share the findings of their research with participants in an accessible manner to encourage dialogue and constructive feedback (Banks & Scheyvens, 2014).

My study involved interaction with people via semi-structured interviews. I also designed a participatory rapid appraisal (PRA) and focus group meetings. To protect the rights of the participants, I adhered to ethical procedures approved by the Human Ethics Committee [HEC] of the University of Canterbury (Appendix 1). Smith (2013) has argued that colonial universities were established as an essential part of the colonising process, bastions of civilisation and a sign that a colony and its settlers had "grown up". Similarly, I argue that my experience of the HEC application and gaining approval for my fieldwork was, in a way, a form of negotiating with colonial educational systems and Western views. Although I found it important to follow cultural protocols and to take into account the perspectives of Indigenous communities when collecting data or samples, and I found it essential to get the consent of participating communities and individuals, I also observed during

the process that both local (indigenous) and international (non-indigenous) researchers have been using methods that are based on Euro-Western paradigms reflecting only the Euro-Western way of knowing. For example, many participants in my research did not really care about confidentiality or "hiding" the information provided by them. Also, although it was very important for the University that I gained consent from the participants, it was actually not necessary in their minds for them to sign the consent form. Some signatories were taken aback, because they were not used to using pen and paper. Yet, as the University required, I followed ethics protocols. This included a few steps with respect to the participants, who were mixed high-literacy and low-literacy people. Because my participants also included students, I had to follow a special, University-imposed protocol to get the students involved in my study.

For literate participants, mainly the ones working with NGOs, and for residents and also students, the ethics procedures involved several steps. First, for the individuals who were residents of Thimphu (housewives, Government officials and the Chief Executive Officer [CEO] of Clean Bhutan), I provided an oral summary of the study so that they had the choice of either accepting or declining to participate. Then, I provided them with an information sheet and a consent form they had to sign. The information sheet outlined the study's aim, background information, the methods used, and the information required, while the consent form explained that participation was voluntary; the consent form also reminded the individuals about the benefits and risks of participation, and stipulated confidentiality. It was made clear to participants that they could withdraw from the study before they signed the consent form, or even after that, but prior to data analysis. This process ensured voluntary participation and the protection of participants' rights.

After I gained participants' consent but before I commenced interviewing, I asked participants for permission to record semi-structured interviews using an audio recorder. For the highly literate group, after I briefly introduced myself and the study objectives, they read the information sheet themselves and asked me questions to re-confirm what they understood. For low-literacy participants, I had to verbally explain the information sheet as well as the consent form, word by word.

To involve farmers in group discussions, I had to obtain permission from the local leader (the *gup*). I followed the same ethics procedures by explaining the information sheet and the consent form to the *gup*, who then instructed the village

representative, the *tshogpa*, to gather farmers for the group discussion. It took a week for the *tshogpa* to gather the farmers. I made sure that the time I chose for the discussion did not disturb the farmers in their work, because they had paddy transplantations and other important activities to attend to. The *tshogpa* provided me with information about the timing of paddy transplantation and irrigation. Most of the farmers were low-literacy participants, so I had to explain everything to them verbally.

I got involved with students when I participated with the school in one of their cleaning campaigns along the Thimphu River. Because I had met the students and got to know them while cleaning rubbish, we had a prior relationship. But for group discussions, I still had to get permission from the school Principal. I had to make an appointment with the Principal and explain my research work. But first, I had to wait for 2 weeks because the students had to take their exams first. Because I had already met the students during the river cleaning campaign, I did not have to organise any visual group activity along the Thimphu River, which was my initial plan. However, I followed the same ethics procedure with the students as I did with other participants, and I recorded their interviews. We also went to the river side and had a visual observation of the river and took photographs before the interviewing.

For the nuns from the nunnery, called Drubthob Goenpa, I obtained permission from the head of the nunnery. I explained research objectives, provided an information sheet and also obtained consent. After I obtained consent from the head of the nunnery, a few nuns were chosen for the PRA. The head of the nunnery chose nuns who were active people, and who, in her view, could give me more information pertinent to my research. I carried out the same procedure for the nuns participating in the PRA by explaining the information sheet and the consent form. They were able to read and understand the information sheet while I explained the specific terms, which they could not fully understand. The formal letters of request to participants (Appendix 2), information sheets (Appendix 3), the consent form for the participating school (Appendix 4), interview question scripts (Appendix 5) and confidentiality agreement (Appendix 6) can be viewed at the end of this document.

Research Methods

With the approval of the University of Canterbury's HEC, I selected participants for the study. In the following sections, I describe how I selected them and how I collected data.

Participant selection

Interview and focus group participants were selected based on the fact that they were residing alongside the Thimphu River and were active users of the water. I approached river communities such as schools, religious institutions and business people. From the available pool of communities, I chose three: the Zilukha Nunnery (Drubthop Goemba), a school and a farmers' group at the downstream end of the Thimphu River. The nuns from Drubthop Goemba gave me insights and information about beliefs and spoke of the religious values attached to water and the river. Farmers became involved because they were the ones affected by the quality of the Thimphu River, and their views illustrated how the common property of the river, if not maintained, affected their relationship between each other and with the river itself. I selected students because they had actively participated in the river cleaning campaign and in cleaning campaigns in other parts of Bhutan, so my interest was to explore and understand young peoples' views on river management and how they related to the waterways around them. In addition, I felt that young people's voices deserved to be heard so their interests could be served (Scheyvens, 2014). The list of targeted groups and participants is provided in Appendix 1, the HEC application.

Data collection methods

Following the selection of participants, I established that data collection is more coherent if it includes multiple methods, so I used semi-structured interviews, PRA and direct field observations to collect the necessary data. I used different methods for different participants and groups. My focus was on communities who contributed to community economies through volunteerism, communal sharing, reciprocal bartering and household maintenance. For some participants, I used more than one method, depending on what they were comfortable with.

Semi-structured interviews. This method was used to collect data from individual residents, officials and farmers. A total of 20 residents were interviewed, and key informants included farmers who were affected by the water quality of the Thimphu River. I also included the CEO of Clean Bhutan, who was actively initiating cleaning campaigns along the Thimphu River. He was also a key stakeholder of Thimphu Water Keepers, which was a newly established NGO set up

for monitoring the water quality of the Thimphu River. Semi-structured interviews were carried out with the residents by going door to door. I first asked their consent, and when they agreed, I made an appointment for the interview at a place where the participant felt comfortable, such as their house or a conference hall, as pictured in Figure 2.

Figure 2. a; Semi-structured interviews with a government official from Royal University of Bhutan
b: Semi-structures interviews with a corporate employee
Note. Photo by author.

Participatory rapid appraisal. My commitment to empower local participants and to respect their knowledge, worldviews and the ability of the participants to analyse their own realities (Stewart-Withers, Banks, McGregor, & Meo-Sewabu, 2014), meant that using PRA was perfect for gaining insights into the religious significance of water, and in particular, the Thimphu River. The participants in PRA were the nuns from the Zilukha Nunnery. The methods I used were pioneered by Kumar (2014), as cited in Stewart-Withers et al., [2014]), Cavestro (2003) and Cornwall (1999).

Space-related PRA methods; First, I created a resource map with the nuns. The participants mapped their water resources, water availability and drainage. The participants could show how they were socially and culturally related to the river, whether they managed the water that flowed within their community, and if they did, how they managed the water.

Time-related PRA methods; Nuns recorded their daily activity schedule. They drew a diagram of their daily schedule as it related to water, and they arranged

water-related activities in a timeline from morning till night. They recorded and described different water uses in different seasons by following seasonal calendars.

Time-line and trend PRA methods; The participants were asked to give their opinions through drawings about historical water use and management in the community. To elucidate trends, the nuns were asked about their views on the changes they had experienced over time in regards to water issues, and the changes that they had seen in the river.

PRA relational methods.

Impact flow analysis; I used impact flow analysis to showcase the impacts of daily activities of the community on the river and its ecology. Participants provided data by drawing pictures. The same method was used to elucidate the values that participants attached to the water and to the river as a whole. These drawings were used to describe cause, effect and the relationship between different variables. For example, the cause could be said to be the effect of daily activities on the ecology and quality of river, and the effect could be said to be on the nuns' beliefs and values.

Thus, by prioritising community learning and subsequent empowerment and action as a key research outcome (Stewart-Withers et al., 2014), and with an emphasis on the participants to speak out as part of our focus on interactive learning (Cornwall, 1999), I completed a successful PRA with the assistance of the Thimphu religious community at the Zilukha Nunnery, as shown in Figure 3.

Figure 3. Nuns at Zilukha Nunnery carrying out participatory rapid appraisal (PRA).

Note. Photo by author

Focus group discussion. Focus groups are described as group discussions that are concerned about a particular issue in which the researcher moderates the

discussion but allows the group to freely explore the issue from different viewpoints (Stewart-Withers et al., 2014). Focus groups involve a small group of people, usually 6–12 participants, who meet to discuss a particular issue set by the researcher (Cameron, 2005). Focus groups are similar to semi-structured interviews because both methods involve verbal exchanges, or dialogues, and their informal manner allows the participant to respond openly in their own words, instead of being restricted to "yes" or "no" responses (Cameron, 2005). Zeigler, Brunn and Johnson (1996) claimed that focus groups provide insights that may not be revealed through other methods such as questionnaires or individual interviews.

The key participants in Thimphu focus groups were the farmers who were most affected by the water quality of the Thimphu River. I chose them based on their experiences in using water for daily activities and for irrigating their fields, and because they faced water access issues every day. Figure 4 shows the group of farmers I involved in focus group discussions.

Figure 4. Focus group discussion with downstream Thimphu River farmers.

Note. Photo by author.

Visual method and group activities. I carried out visual and group activities with students aged 15–16 years who attended Yangchenphu Higher Secondary School. It is a popular trend in Bhutan to include students in many activities, starting

from cleaning campaigns to organising important events. Youth have been given credence by the Government and are considered the future of the nation. Because I have personally gone through the youth stage of development, and with the trend to involved youth in activities like cleaning up rivers, I felt that it was important to know how students really felt. Following the methods espoused by Einarsdóttir (2007), I built a relationship with the students. I participated in one of the river cleaning campaigns with the students and allowed sufficient time to build rapport with my future research participants. Thus, I hoped to develop their confidence and to encourage active participation from them (Scheyvens, 2014). Figure 5 shows the fieldwork that I carried out with the students along the Thimphu River.

Figure 5. Cleaning rubbish from alongside the Thimphu River with Yangchenphu Higher Secondary School students and Government agency representatives.

Note. Photo by author.

Although my plan was to give the students control and to make them initiate the cleaning campaign, I took advantage of the situation when Government agencies initiated the cleaning campaign themselves. I joined the group and made myself familiar to the teacher, who was in charge, and who advised me to get permission from the Principal before I carried out any group discussions with the students, a process that took 2 weeks. After obtaining permission, I traversed the Thimphu River for a second time taking photographs to provide an overview of the situation in terms

of water quality. With a group of eight students, we first took a sightseeing tour, and then carried out a group discussion to find out their views on why they needed to manage the river and what they did with the nearby streams, what they had learned from managing the streams, what they enjoyed while cleaning rubbish, and what they did not like. Figures 6 and 7 show the field study and students involved in the group discussion, respectively.

Figure 6. Making direct field observations of the Thimphu River with students from Yangchenphu Higher Secondary School.

Note. Photo by author.

Figure 7. Group discussion with the students from Yangchenphu Higher Secondary School.
Note. Photo by author.

Secondary data collection

To obtain water quality data from the Thimphu River, I made use of the relatively recent studies carried out by Bhutan's NEC (2016), Giri and Singh (2013), and a more recent study carried out by Currinder (2017). Furthermore, I carried out semi-structured interviews to collect the opinions of the local communities on the water quality of the Thimphu River.

Data management and analysis

Secondary data including the data collected during interviews, group discussions and daily observations were organised and recorded on my laptop. Text I transcribed during interviews was condensed and compiled into short forms, which I categorised into different themes. Comparisons of data I obtained from text and fieldwork were made whenever needed. Finally, I analysed all the related information obtained from my literature review, photographs and other sources like social media (mainly Facebook), direct observations and interviews. I condensed data to obtain a final result, which I describe in chapter four.

Chapter Four: Our River, Our Drainpipe

Globally, exploitation of freshwater and the related "development" of societies have been made possible by increasing knowledge of water engineering, large-scale water supply, flood mitigation and irrigation management (Savenije, Hoekstra, & van der Zaag, 2014). Humans have changed many catchments worldwide by either diversion of rivers for supplying cities, industries and agriculture, or by construction of dams (Savenije et al., 2014). As a result, an increasing number of signals — from pollution of rivers and decreasing groundwater and lake levels, to disappearing wetlands — show current use and management of water systems is not sustainable (Hoekstra, 2013; Molden, 2007; United Nations [UN], 2012). These signals have brought an increasing recognition that water and river systems are not merely there to be exploited; rather, a balance should be struck between fulfilling human needs and sustaining ecosystems (Falkenmark & Rockström, 2004). The global water crisis throws up a particular challenge to acknowledge those ecological connections that sustain our very own survival and existence. We live within networks, webs and relationships with non-human (or more-than-human) others, including plants, animals, rivers and soils (Weir, 2015). We rely on each other for food and fresh water. We are co-participants in what is happening and what will happen next.

Because of globalisation, Bhutan is facing the same challenges, and these issues have had immense impacts over the last few decades. As described in chapter three, globalization had affected not only the production and consumption of products, but also knowledge, culture and the environment in Bhutan. Environmental challenges such as deforestation, climate change, pollution and water depletion have arisen in a landlocked country.

In chapter four, I illustrate the health of the Thimphu River and the changing connections between human communities relying on its waters for sustenance. This exploration addresses my research objective of understanding and exploring the connections between communities and the Thimphu River, including both physical and social connections.

The Thimphu River

The Thimphu River is fed by permanent and seasonal snows, glacier melt and monsoon precipitation (Planning Commission, 2009; Department of Forests and Park Services, 2009). It is one of the tributaries of Wangchhu River, which is one of the

four major rivers in Bhutan (Lhamo, 2015). The Wangchhu River has a total length of 137 kms and is characterised by rugged mountain topography, with approximately 45% of its basin area covered in forest (Lhamo, 2015). This basin is the most populated region in the country, with 26% of Bhutan's population living in it. After crossing Bhutan, the river reaches India, where it is known as the Raidak River and where it is one of the tributaries of the Brahmaputra River, which flows into Bangladesh (Lhamo, 2015). The Thimphu River flows through one of the most urbanised cities in Bhutan, Thimphu City, with a population of 94,102 out of the total country's population of 634,982 (as per 2005 figures) (Bajaj, 2014). The rate of increase in population in Thimphu City is 7%–10% yearly, and this one city holds 40% of the entire urban population in Bhutan. Population growth has led to more infrastructure and intensified land use supporting city expansion (Thimphu City Corporation, 2010).

The river originates in the alpine mountains of Lingzhi County (*gewog*), in the Thimphu Region (*dzongkhag*). As it passes through the urban capital, it serves as a source of water for agriculture, domestic purposes including drinking, sanitation and recreation, and it runs two hydropower stations. It also sometimes serves as a burial place for the deceased. At the same time, it is also affected by intense land use via urbanisation, and construction of concrete infrastructures such as bridges, roads and buildings, which increase runoff into the river. In addition, the river receives a variety of wastes from agricultural, domestic and natural sources (Giri & Singh, 2013).

In the upper catchment, two small streams, the Jaradinthangchhu and Paglekachechhu, form the upper Thimphu River. As it moves down the sub-basin, numerous east–west-flowing streams and tributaries, the Charichhu, Samtellingchhu, Chubachhu, Olarongchhu, Nabirongchhu, Chumdorumchhu, and Bjimenachhu, join the main Thimphu River (Department of Forest and Park Services, 2009). A satellite map of the Thimphu River flowing through the city and the study area is shown in Figure 8.

Figure 8. Satellite image of the Thimphu River (blue line) flowing through Thimphu City.

Note: Created by author from Google Earth.

The river has a perennial flow, with high flow during summer and low flow during winter. The river has steep longitudinal gradients and narrow gorges in the north, which open up and provide a broader valley with small areas of flat land for cultivation and settlement (Fakhruddin, 2015). According to the Food and Agriculture Organization (FAO, 2011), there is no precipitation from December until March, which is the winter season. Rainfall starts again in March, with an average of 20 mm/month, and increases steadily, reaching 220 mm in August. The total annual rainfall is 650 mm on average (FAO, 2011). Flow of the Thimphu River varies from 3 m^3/s to more than 80 m^3/s, with an average annual flow of 22.6 m^3/sec. The maximum flow is observed in July and August, and the minimum flow in February and March (Department of Forests and Park Services, 2009). In 2013 and 2014, the flow regime was relatively stable and had minimal variation; average flow of the river in 2013 and 2014 was more than 100 m^3/s in summer and less than 10 m^3/s in winter (Fakhruddin, 2015).

Flowing down the mountains with great force, the Thimphu River, like any other river in Bhutan, represents an enormous potential for hydropower. This river, together with other rivers, has thus been harnessed to produce hydroelectricity, which

is exported to India and has made a big contribution to the profits generated for Bhutan. India imports 75% of its electricity, produced more cheaply by many of these projects, from Bhutan, which contributes 25% of Bhutan's GDP (Royal Government of Bhutan, 2010).

It was observed that upstream tributaries and springs flowing into Thimphu River, while cleaner, have mostly been diverted or stored to provide water to communities in Thimphu City Council, some corporations like Bhutan Power Corporations and sometimes by the individual residents. However, the downstream part of the river, which is more polluted, is unmanaged. While water quality research in Bhutan is limited to only two recent studies, these studies have shown that the downstream health and water quality of the Thimphu River been affected by anthropogenic activities (Currinder, 2017; Giri & Singh, 2013). Currinder (2017) carried out a water quality test along the stretch of Thimphu River starting from upstream, all the way to the downstream end just before the terraced fields at Namseling. The study showed a gradient of anthropogenic disturbance in which an undisturbed, forested upstream area contrasted sharply with an impacted downstream area (Currinder, 2017). The land use conditions and associated water quality parameters Currinder (2017) found are summarised in Table 1. The map in Figure 9 shows the area where the samples were taken (Currinder, 2017).

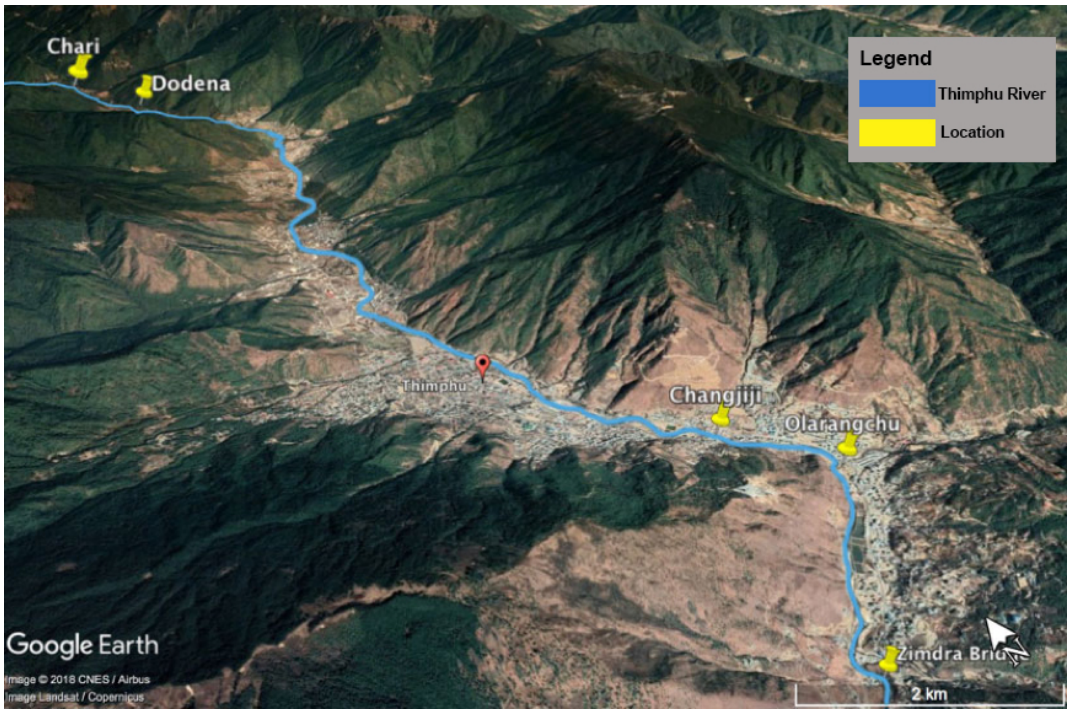

Figure 9. Satellite image of Thimphu River area tested by Currinder (2017).

Note. Yellow location pegs indicate water sampling sites (created by author from google earth)

The Currinder (2017) results, detailed in Table 1, show high levels of *Escherichia coli* and coliform bacteria, and confirm that the water is not acceptable for primary (drinking, cooking, etc.) or secondary contact (recreational uses).

Table 1

Water Quality Test Results for the Thimphu River, 2017

Test parameter	**Test area and land use**				
	Chari	**Dodena**	**Changjiji**	**Olarongchu**	**Bridge (Zimdra)**
	Protected forest	Protected forest	Urban	Urban	Urban
E. coli (cfu/100 ml)	0	0	4,533	3,933	2,900
Coliforms (cfu/100 ml)	100	100	16,000	10,533	9,000

Notes. Test results courtesy of Currinder (2017). According to Currinder (2017), all contaminants measured in urban areas were above maximum acceptable values for primary and secondary human contact.

Abbreviation. cfu, colony forming unit.

River Movement and Relationships

In contemplating how people treat the river, a range of human activities in relation to vertical, lateral and longitudinal river movements have been previously defined by river ecologists (May, 2006). Lateral connectivity (between the watershed and the river) includes the roles of plants and animals in the watershed, the geomorphology of sedimentation and channelisation, and the delivery of nutrients, soil, debris and organisms between the water and its shores (May, 2006). Longitudinal connectivity works from upstream to downstream, and vice versa, and it includes issues of migration of aquatic species and delivery of organic and inorganic materials up and down the river (May, 2016). Vertical connectivity concerns exchanges between river and ground water, subsurface differentiation of habitats (such as surface vs. benthic, or river-bottom environments), convection, and local differences in water quality, temperature, and turbidity (May, 2016). In the current study, I focus only on the longitudinal connectivity of the Thimphu River from upstream to downstream. With the movement of the river from upstream to

downstream, humans use the river many ways, thus compounding anthropogenic effects on the health of the river. As the river flows downstream, relationships between it and communities depending on its waters are compounded by upstream uses. Depending on different human interactions with the river, water quality at different sections differs, and the river is treated differently according to water use categories. Various small streams (*rongchu*) and springs flow into the Thimphu River, and these form a key connecting life force between communities.

To better understand the physical connections and relationships between the river and human communities, I have divided the river into three sections: upstream, middle stream and downstream. Different uses and different relationships are described by section. The information is presented in the following order:

1. a description of the river sections using satellite maps and including my direct field observations;
2. a review of water usage according to already published literature;
3. an analysis of my direct field observations in which I compare photographs collected from already published literature and my fieldwork; and
4. an exposé of opinions from communities I gleaned through semi-structured interviews, focus group discussions and PRA.

The upstream area.

Description with satellite map. The upstream area of the Thimphu River is between Dodena and Kabisa, where population density is lower than in the city. Monasteries nestle in the hills and a few settlements surround the river. This area is at an altitude of 2,600 m ASL and is mainly covered with forests, with steep hills on one side and a flat valley on the other side. The river is at least a few kilometres away from the settlements, and human activities in the urban areas have minimal impacts on it. The upstream area of the river is shown in Figure 10. From the satellite map (Figure 10), it is evident that upstream settlements are sparse.

Figure 10. Satellite image showing the upstream area of the Thimphu River.

Note: Created by author from Google Earth.

Existing river data. Studies carried out to monitor the Thimphu River have shown that in upstream reaches, water is relatively clean, with diverse and high-density populations of sensitive benthic macro-invertebrates such as Ephemeroptera (E), Plecoptera (P) and Trichoptera (T) (Currinder, 2017; Giri & Singh, 2013), yielding a good EPT ratio. Water temperature, pH, conductivity, total dissolved solids, turbidity, dissolved oxygen, nitrate, phosphate, chloride and faecal coliform and *E. coli* tested were found to be within the permissible limits for primary and secondary human contact, and did not pose any threat to aquatic or terrestrial beings.

Field observations. During my fieldwork, I saw that the river was relatively clean in this section. I could see that the river was not easily accessible for domestic use, and that draining grey water from households would be difficult due to the distance of settlements from the river's edge. Figure 11 shows a photo of the upstream section of the Thimphu River, which is clean.

Figure 11. The clean upstream reaches of the Thimphu River.

Note. Photo by author.

Opinions of the communities. According to key interview informants, water in the upstream reaches can be used to drink without chemical treatment or boiling. Aum Kinley Dem (female, age 45), who was also the leader of the community waste management programme, thought the water was very clean in upstream areas. She said,

> We are very blessed, and if in case there is a shortage of water from other springs and streams, the water from Thimphu River can be used for our drinking purposes. I see many school students come and wash their clothes near the river and they have fun and play all day long along the river. It is used for all sorts of things and it is valuable from an aesthetic to nature to cleanliness point of view for our own surroundings.

The values that Aum Kinley Dem placed on the Thimphu River were recreational and aesthetic. In addition, she also believed that the river had healing potential because of all the minerals present in the water. According to her, many people collected stones from the river and heated the stones for hot baths in the belief that the bath would cure diseases, especially those related to bones.

Middle stream area.

Description with satellite map. As the river reaches the beginning of the urban sprawl, which is around 15 kms downstream from Kabisa, settlements and infrastructure like bridges and buildings can be seen alongside the river. The satellite map of the middle stream reaches is shown in Figure 12.

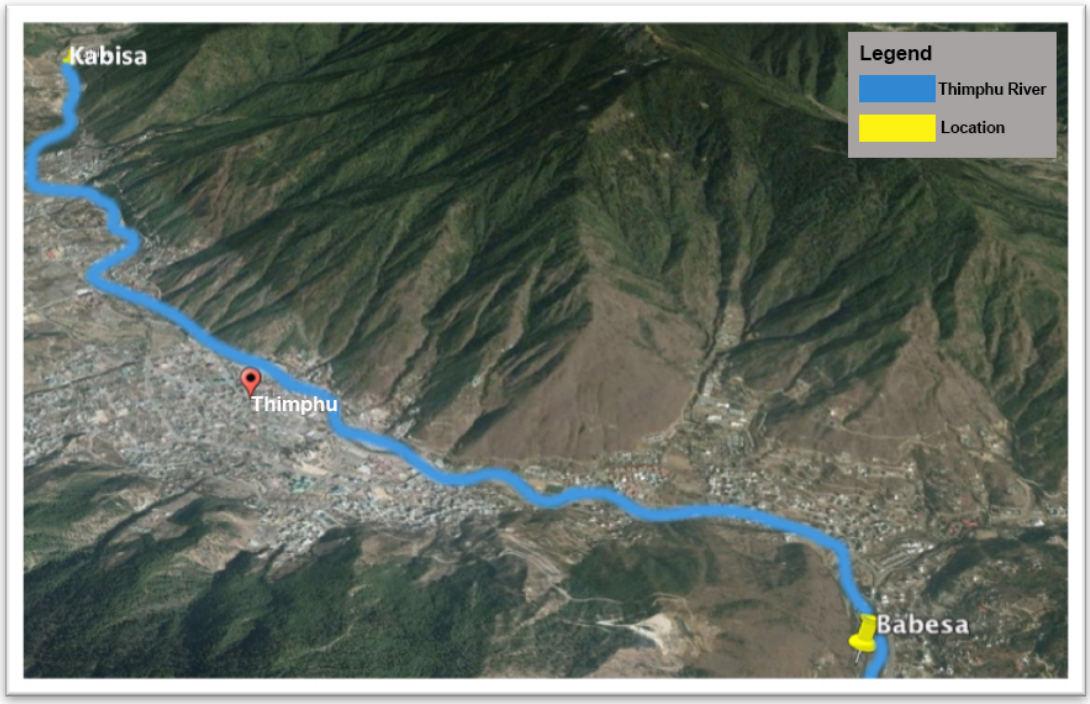

Figure 12. Satellite map showing the middle stream, highly urbanised area along the Thimphu River.

The middle stream section shown in Figure 12 supports the highest number of settlements. It also sports the most roads, bridges and buildings. Human activities like open markets, park festivities and large numbers of new construction sites were evident everywhere when I visited on May 2017.

Existing river data. According to the NEC (2016), assessment for the mid-stream reaches of the Thimphu River showed that pollution load peaked near the vegetable market, which is at the mid-point of this stretch of the Thimphu River. Data also suggested deteriorating water quality around the central city area due to high anthropogenic contamination (NEC, 2016). In addition to the vegetable market, the sewage system flows into the river nearby. According to Phuntsho et al. (2016), the sewage pipework does not have enough capacity to service the whole population,

and the existing sewage treatment plant has a capacity that is far too small as well. The treatment plant covers less than 20% of the total municipal area. The rest of the population uses septic tanks and traditional pits, which have every chance of seepage into groundwater and rivers, thereby polluting freshwater reservoirs (Jamtsho, 2010). Sewage wastes from septic tanks and traditional pits overflow during rainy seasons. The existing wastewater treatment plant is located at Babesa, adjacent to the river, as shown in Figure 13.

Figure 13. Sewage pond at the Babesa sewage treatment plant near Thimphu City.

Note. Photo courtesy of Phuntsho et al., 2016.

Thimphu City is beginning to experience increased flooding due to an expansion of non-permeable surfaces and poorly planned drainage systems (Dorji, 2016). Storm water from drains and road networks flows directly into the river during heavy monsoon rainfall, along with a variety of wastes. This outfall is illustrated in Figure 14.

Figure 14. Storm water overflow and runoff in Thimphu City, situated in the middle reaches of the Thimphu River.

Note. Photo courtesy of the National Environment Commission (NEC), (2016).

According to the NEC (2016), population growth, burial customs and rapid urbanisation have outpaced sewage treatment and solid waste collection, thus threatening riverine water quality. It is a cultural and traditional practice of the Bhutanese to use rivers for burial. In Bhutan, stillborn babies and babies under 5 years of age are not cremated, but are put inside wooden cages and submerged in deep parts of a clean river (NEC, 2016). Water is also the final resting place for the ashes of the cremated bodies of adults. The ashes are buried in the river as part of the final rites. The bodies of children under the age of 5 who cannot be cremated due to cultural beliefs, are sometimes buried in the river as is (NEC, 2016).

In addition, outflows from car washing and from numerous mechanics' workshops affect water quality (NEC, 2016). More than 47 automobile workshops operate near enough to the river to discharge overflows into its waters (NEC, 2016). No appropriate filtering or treatment systems for the water being flushed from these workshops exist (NEC, 2016). Vehicle and road-related pollutants include oil, tar products, dioxins, oxygenated compounds, halogenated phenols, metals, hydrocarbons, de-icing salts and asbestos (NEC, 2016). Although no studies have been carried out to quantify road runoff, it does occur as well (Figure 14), and it contains a complex mixture of toxicants (Beasley & Kneale, 2002).

Field observations. My direct field observations corresponded with facts available from already published literature. I saw a cremation ground where the dead are cremated and where the river is used as a burial site. The bodies of the dead are cremated on the cremation ground which is located near the river and the ash is finally scattered into the river. In addition, I observed that almost all grey water from households flows directly into the river, dumping contaminants from soaps, shampoos and other wastes into its waters (Figure 15). The area I observed supported many industries, especially automobile workshops, which I saw draining oil and lubricants directly into the river. Many automobile washing facilities operated in the same area, and they drained contaminated car-wash water into the river.

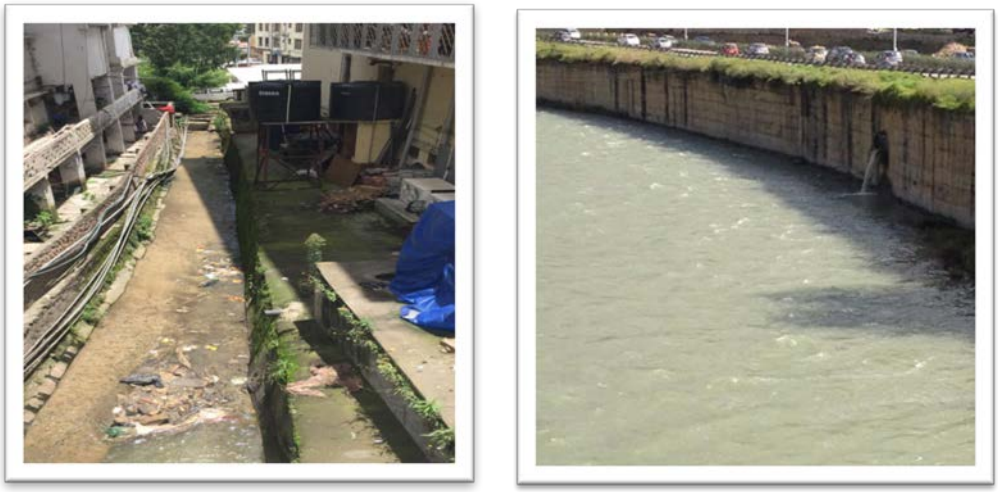

Figure 15. Grey water drainage from Thimphu City households flowing directly into the Thimphu River.

Note. Photo by Author

In addition, I could see that the Thimphu River was being filled with solid wastes disposed of by communities along the riverbank, which eventually landed in the river, thereby polluting it (Figure 16). I observed people disposing solid wastes directly into the river as well.

Figure 16. Solid wastes floating in the Thimphu River (red arrows), and a build-up of solids on the shoreline, much of it non-biodegradabel plastic.

Note. Photo courtesy by Clean Bhutan (2017)

Like any fresh water body in urban areas, the Thimphu River has become vulnerable to contamination from land uses that discharge contaminants into storm water drainage systems. These systems often discharge into local streams and then into the Thimphu River. Livestock are allowed direct access to the river, where they muddy the waters, and urinate and defecate directly into the river (Figure 17).

Figure 17. Cow in the Thimphu River.

Note. Photo courtesy of Dorji (2016).

Opinions of the communities. The opinions I collected through semi-structured interview varied. Aum Bidha, a female farmer (age 60), said,

> The sewage treatment plant next to the river is not very effective and the sewage flows directly to the river. The river as we call it, *tsangchu* (meaning clean water), is contradicting the name now. It is not clean at all and has become sewage itself. It may be clean and drinkable upstream, but after this area [where the plant is], I am sure the water is not drinkable. Sometimes the people stir the sewage plant and at that time, it is difficult to stay in our house because it causes an awful smell that spreads in this area.

According to Aum Kinley Dem (female, community leader, 45),

> The centenary market area is one of the highly populated areas in the city. Our clean river is abused at that area where they drain all the sewage water into the river directly [overflow of septic tanks]; in addition, they throw all the rubbish, plastics, rubbers, clothes, which is very sad. And during the rainy season, it becomes an eyesore with all sorts of rubbish around. So I feel that if we keep on doing that, our river will dry up.

Dema (female, housewife, age 35) stated, "I think we need to stop and prevent the industrial wastes draining into the river. We have automobile workshops downstream which are draining all the wastes in the river. But I think these wastes are affecting our aquatic ecosystem."

The downstream section.

Description with satellite map. Further downstream at the far end of the city, residential areas and agricultural fields lie directly alongside the river. Figure 18 shows a satellite image of terraced paddy fields. The downstream section is also home to residents in suburbs called Babesa, Namseling and Debsi.

Figure 18. Map showing terraced fields and suburbs alongside the downstream area of the Thimphu River.

Existing river data. The farmers downstream from Thimphu City mainly grow rice on their small land holdings and use pumps to get water from the river to irrigate their paddy fields. Small paddy fields lie alongside the river, which makes it easy for the farmers to pump the water (Bajaj, 2014). Thimphu has a total area of 690 ha of rice fields (Shrestha, 2004). Irrigation of these fields is mainly carried out during May and June during the transplanting season, which also happens to be a time of reduced rainfall. This means farmers take water from the river and from other small streams, which flow into the Thimphu River, to irrigate. Other crops that are grown in this area are maize, wheat, apples, peaches and apricots (Giri & Singh, 2013). These require water too. However, total coliform counts were found to be higher in the downstream section of the river across all seasons, too high to drink safely (Currinder, (2017; Giri & Singh, 2013). This result could be attributed to the presence of faecal matter along the river.

Knowledge about irrigation water quality is critical as it can affect fertility needs of plants, plant health and production (Bauder, Waskom, Davis, & Sutherland, 2011). Irrigation water has effects on crop production and soil quality through

changes the process makes to soil salinity, pH, alkalinity, nutrient availability and microbial pathogen burdens (Bauder et al., 2011). Furthermore, during recent times, people downstream areas have been experiencing water shortage problems. A recent newspaper article titled "South Thimphu's Water Shortage Worsens" (Nima, 2015) indicated that communities were left without water for almost 9 days. To aggravate the problems, many rock-mining companies have recently been established, causing problems with drinking water and introducing new health hazards from mine runoffs. A newspaper article titled "Second Hearing on Gidawom Mining Case" (Palden, 2016) reported that Gidawom villagers in Mewang County (*gewog*) in Thimphu had taken the mining companies to court over adverse impacts on their community, health, water and properties. This problem was confirmed during my field visit to the area and through the verbal reports of local farmers, which are described in the following sections.

Field observations. I made field observations in the downstream Danglo and Gidawom areas. I saw how the people were experiencing damage to their properties and declining water quality. A tributary stream called Jigme Rongchhu flows through Gidawom, which then flows into the Thimphu River. I observed that some communities in Danglo used water directly from the Thimphu River, while people in Gidawom used water from the tributary, the Jigme Rongchu. Both communities were facing negative impacts on their fields and their health.

In Danglo, communities using water from the Thimphu River were facing health issues due to the pollutants in the river. In Gidawom, I observed quarries upstream of the village, which used water from the river. Pollutants, mainly small rock particles from the quarries, flowed directly into the tributary streams and the river. Figures 19 shows a tributary above the quarry, above where pollutants are discharged into the water. Figure 20 shows the state of the tributary downstream from where the quarries drain pollutants from their rock-washing station into the river.

Figure 19. A relatively clean tributary upstream of quarries.

Note. Photo by author.

Figure 20. The same tributary downstream from the polluting quarries.

Note. Photo by author.

The farmers also complained that construction workers and employees working for other types of industries defecated directly into tributary streams and the river. I saw that farmers used the same water in their irrigation canals. The sediment-laden, debris-filled state of one irrigation canal is shown in Figure 21.

Figure 21. Irrigation canal filled with sediments, debris and rock particles.
Note. Photo by author.

According to the farmers I interviewed, the soil in their fields had become very hard due to sediment from the river, making cultivation difficult and negatively impacting production. I could see that the farmers in Danglo and Gidawom were not happy with freshwater quality. They remembered the water as being clean and drinkable a few decades ago, and they considered it blessed and holy. Yet, they felt that to even swim in it in modern times would cause diseases. The opinions of the farmers are described in the following section.

Opinions of the communities. Some local residents living in downstream areas who participated in semi-structured interviews felt that the water from the Thimphu River could be used for drinking and domestic use if pollution and the direct dumping of trash were curtailed. One key informant said,

> If we do not pollute our rivers and streams with trash, perhaps the water problem could be solved. We should be more concerned about not polluting by dumping our trash into the streams so that we can use water from the fresh flowing streams and rivers for our needs.

> At least the water quality is not polluted by chemicals and other heavy metal (so far). (Gembo, male, age 30)

Focus group discussions with farmers in Danglo and Gidawom yielded broader insights, which were supported by my direct field observations. According to Danglo farmers, the changes in waterways that had occurred over the lifetimes of their elders, who had been using the river for irrigation as well as recreation, had been remarkable. They were once able to drink water straight from the rivers, and now even the fish and other aquatic creatures struggled to survive. According to them, the numbers of fish had reduced over the years. It was no longer possible drink water directly from the river. One farmer, Kinley (female, age 46), said,

> We used to go and wash ourselves in the river when it was hot. It was good times. It was around 20–30 years ago. With population increases, wastes are dumped in the river. Even sewage flows directly into the river. They treat our river like a drain and throw everything there. People upstream do not think that this river has to be used by the people living downstream like us in Danglo. Now forget about drinking the water from the river, even to put our feet in the river is not safe.

With the current state of the river, the people also reported having lost opportunities to connect with and reaffirm relationships (physical or cultural) with the river and with each other. One said,

> We do not go to clean our hands after we play archery near the riverside. If we wash our hands in the river and eat with them [afterwards], we get sick. And when we get tired from our work and wash ourselves in the river, we come out clean but after a while, we get a rash and our eyes swell. It looks clean but there must be some pollutants which cause rashes. (Rinchen, male, age 50)

Kinley, a female farmer (age 46), concurred.

All the farmers I spoke to felt that the Thimphu River was treated like a drain, which affected all ecological lives and the humans who used the water in downstream communities. In Gidawom, farmers were undergoing the same experiences as rural communities in Danglo. Although the water they used was from the Bjimena Stream, the effects of pollution were the same. During the focus group discussion, Gidawom farmers described the negative effects of river degradation:

> It is not alive today. Not only from just looking at it, but what it produces. Our fields become very hard and our agricultural production is affected by using this river. Yes, I've seen the changes. I've seen the time when the river did produce for us well, when the river was clean, you could see the bottom of it. It is considered to be a holy river as the source is from Guru Rinpoche's cave in Tsalunye, and it is believed to be a blessing for the community to live long lives. But to see it now it makes you wonder how anything could live in it actually, like the fish and the microorganisms and all that. Our basic survival is compromised by the quality of water we use for our daily activities. (Aum Rinchen Lham, female farmer, age 59)

Another farmer mentioned that before, they could drink directly from the stream as they considered it blessed and holy, and that now, to even swim in it would cause them harm. Aum Lhamo (female, age) stated:

> As I look at it, I see a rubbish tip. Just surviving, that's it. You can't drink it. You can't swim in it. The river has become a drain. The quality of the water is what you would find in a gutter. Just a few weeks ago, I saw lots of dead chickens disposed of near the river. I don't know who would do such a thing. I would not go swimming in the river; neither would I let my children play in it.

According to these rural communities, before the mining companies were established, they had no problems and were happy with the quantity as well as the quality of water for drinking and irrigating. It was just few years ago that the mining companies had been established. According to them, the ecological loss that had occurred since then was significant with respect to the range of life that had been destroyed within a short timeframe, and the wide-ranging scale of this destruction included forest, mountains and rivers. In addition, their houses were also damaged. One farmer stated:

> These companies pay huge amount of taxes beneficial to the country's economy and we as common people cannot do that. It may be because of that. We farmers here are like small ants being crumpled by [big] feet. These quarries have lots of money and their income is in the millions, while we are people with small incomes and are in the background, and we are left with not even the rights to

> safe drinking water. Our agricultural production has really decreased due to the polluted water that we use for irrigation and also due to the shortage of water. The [mining] companies have been blasting all the hills and mountains, and our drinking water source is from these hills and mountains, which we feel is badly affected. This has also affected our homes. (Omu, female farmer, age 56)

To get an overview of the Thimphu River, I interviewed the Chief Executive Officer (CEO) of Clean Bhutan, Nedup Tshering, who is also responsible for the Wangchhu Water Keepers. According to the CEO, Bhutanese people have a view that of "out of sight is out of mind", which is why they tend to throw wastes into the river. He thought that the upstream communities did not care about the downstream communities. He said,

> Our country has lots of places to throw wastes, like in the bushes and forests. People hide it and throw their wastes there, and when it rains, these wastes flow into the tributaries and then into the river. It has to be individual responsibility, and they have to think about the consequences of their actions on the environment and the community at large. (Nedup Tshering, male, age not stated)

The frustrated voices of residents, farmers and downstream communities show that there are many concerns regarding the quality of the Thimphu River water. Quarry practices show that their focus is on making money, and therefore, they treat water as a commodity. Thus, commercial demand on water continues to focus on production, and the mainstream economy continues to focus on monetary exchanges, with no allowances for other diverse and profound valuations to be placed on water. Ecology, cultural and spiritual values do not seem to have meaning in the commercial world.

The physical relationship I observed that people had with the Thimphu River was of a matter of concern. I also came across some connections with the river that were of a different dimension. The connectivity of traditional and spiritual beliefs with the river was still present in some communities. As discussed in chapter three, such beliefs and values influence perceptions and behaviours. The following chapter shows how Thimphu River communities perceive the river and thus behave around it.

Chapter Five: Changing Perceptions

This study seeks to understand Thimphu residents' physical relationships and connections with their river. In the previous chapter, I reported verbatim semi-structured interview responses, thus highlighting residents' feelings about and connections with the river. Although communities need water from the river, their responses indicated that relationships with the river were strained by changes to water use. They reported that strained relationships between user groups and between themselves and the river have had consequences on how they perceive the Thimphu River. How they treat the river has consequently changed.

Thus, in this chapter, I seek to uncover and analyse my second research objective*:* to study perceptions of the Thimphu River. To achieve this objective, I observed water and habitat quality along different sections of the river, and I conducted semi-structured interviews with residents in different communities living along upstream, middle stream and downstream sections of the river. I included the spiritual community, Drubthob Goemba and students attending the Yangchenphu Higher Secondary School. I uncovered four key themes about how the different communities perceived the river. Information gleaned from interviews was coded into the key themes. The themes are shown in Figure 22. They are: 1) the river as a commodity; 2) the river as its own ecology with scenic, health and recreational values; 3) the river as a community concern, defined by a caring perception; 4) and the river as a spiritual being, with cultural perceptions attached. While the river was perceived as a commodity at one end of the spectrum, perceptions of ecology, scenic and recreational values, and traditional values about water were more closely related.

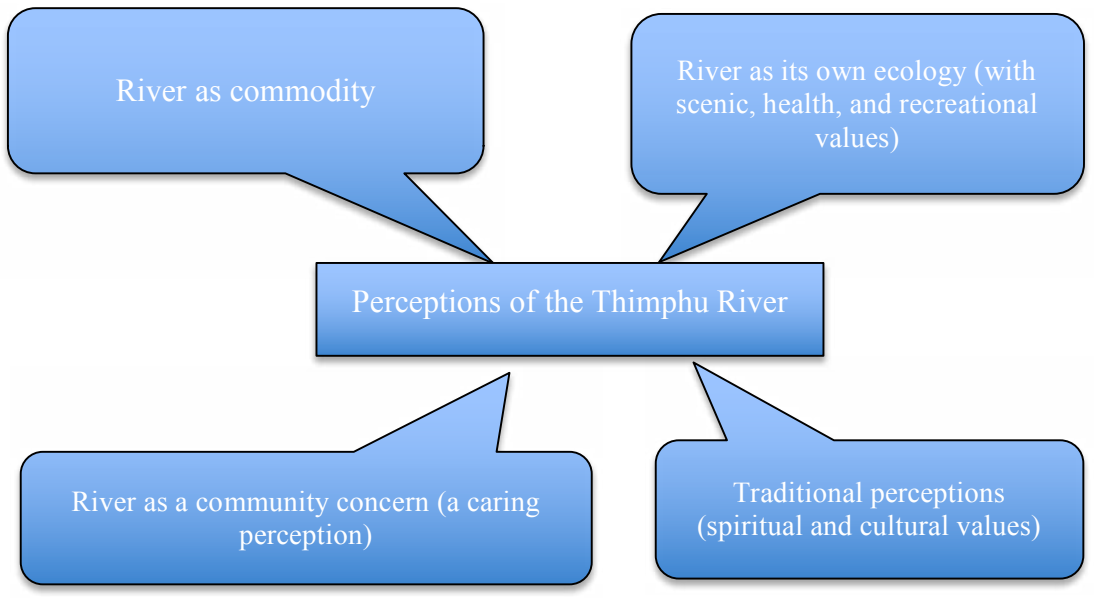

Figure 22. Perceptions of the Thimphu River as voiced by residents living along the upstream, middle stream and downstream reaches.

The River as a Commodity

From the interviews, I found that one of the main attitudes of local people towards the river was that water from it was a commodity used for human consumption. The value of water and connections with the river depended on how well the community could use or consume the water. The value of the river was attached to how much money the country could get from exported water or hydropower, and I also observed that some companies, like the mining companies, did not really care about the river or communities downstream as long as they got their jobs done (e.g., washing minerals and stones).

I also found that local residential communities perceived the Thimphu River as their exclusive property and as a private commodity not to be shared. These communities felt free to use and exploit the river. For example, along the upstream reaches of the river, where the water was cleaner, communities took water directly from the river. Some communities had formed informal associations and had arranged their own distribution system with no one to oversee their activities. Wherever there were clean streams flowing into the Thimphu River, people had rushed to the source of the stream and had claimed that the water and the stream belonged to them individually, or belonged exclusively to their community. Once they had water flowing well into their houses and properties, they cared less about the source of the stream or what went into the river. Although they made and tried to

share water as "the commons", I found that there was no caring or taking responsibility to manage the river for everyone's benefit. Some local communities did not even care where their water came from. There was no connection between the people and the environment with respect to the river, which was considered private rather than common property. Figure 23 illustrates how various communities perceived the Thimphu River as a commodity.

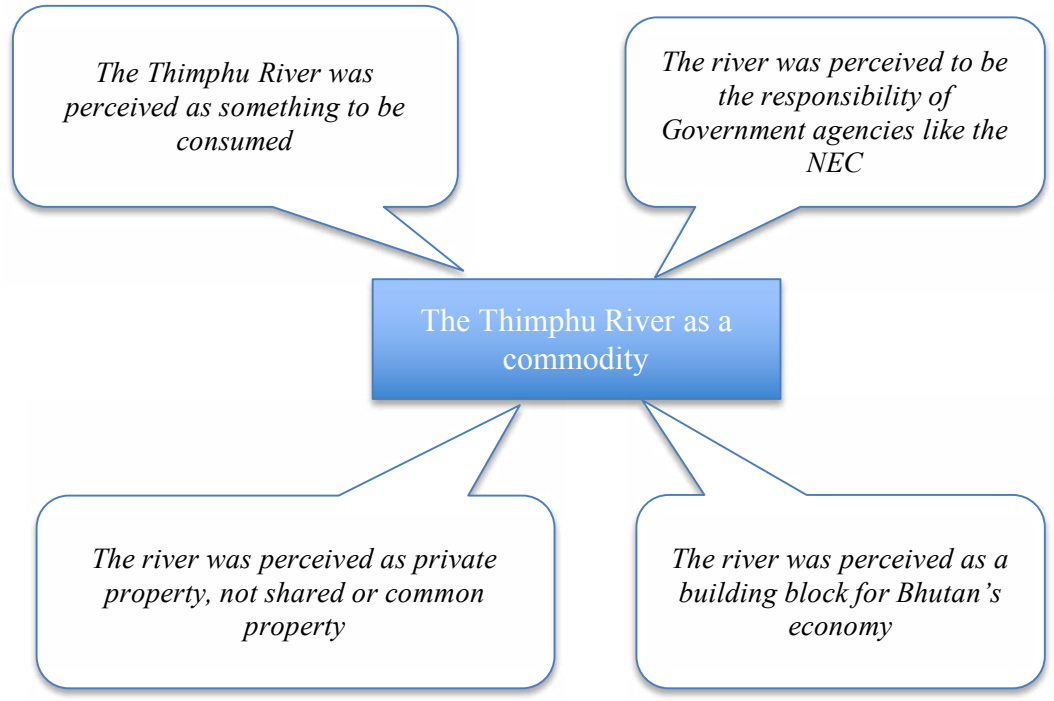

Figure 23. The components of various communities' perceptions of the Thimphu River as a commodity.

Abbreviation. NEC, the National Environment Commission in Bhutan.

With their perception of the river as a commodity, communities treated the river as invisible, and they took it for granted. Some communities also privatised the water source. Even within spiritual communities, nuns perceived the river as having "no connection" to themselves. Spiritual connections with the river were not really acted upon due to emotional distance from the river. Communities did not even realise the damage they were doing to the river when their grey water was released from their households or from the nunnery into the river. Figure 24 shows some of the interview responses detailing the emotional disconnect people felt when they described the Thimphu River. Figure 24 also illustrates human behaviours that were a consequence of treating the river as a "thing" to be privatised or owned.

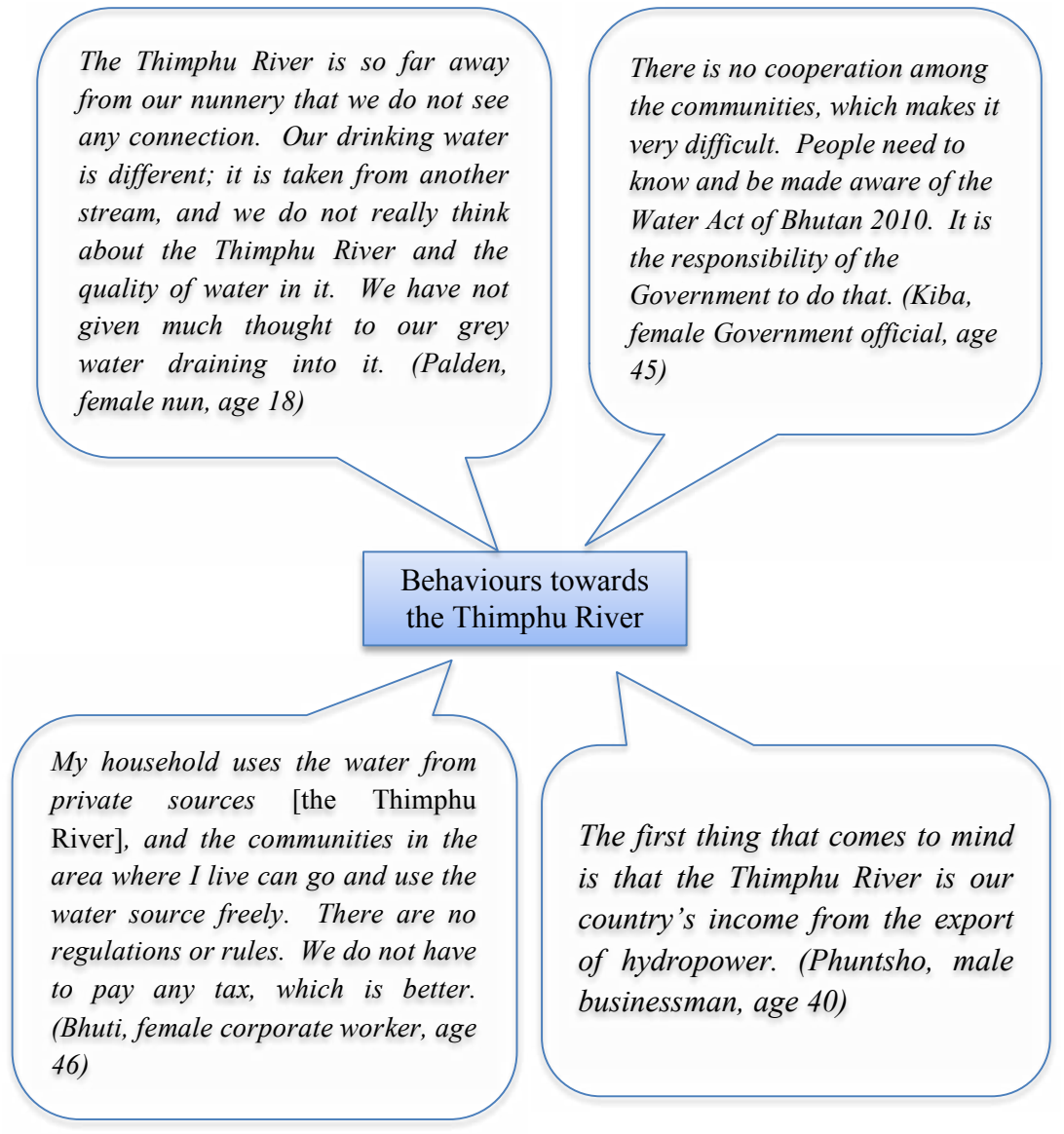

Figure 24. Behaviours and attitudes of various sectors towards the Thimphu River.

It is clear from Figure 24 that disparate, seemingly unconnected communities perceived the Thimphu River as a commodity and its water as something to consume. In addition to the statements show in Figure 24, farmers voiced commodity-based values:

> In the case of the Government bringing in new technology to try to deliver [water] to our households for our use and purposes, then the river will be of use and of value. Otherwise, I do not see any value in our river. Even if it is made clean, I do not think it will be fit to drink. (Passa, male farmer, age 55)

Because of how they perceived the river, some communities did not really care or realise the damage they were doing to the river. One interviewee stated, "I have not thought and realised about it until you have asked me about the river. I have not really given much thought to how my household activities affect the river" (Ugyen, female housewife, age 36).

Ecological and Aesthetic Perceptions

What we as Bhutanese have known from Western knowledge and science is that water is important for the ecological and aesthetic elements of our landscapes. Almost all interview informants were aware of these aspects. Most of them showed high interest in conservation of the environment, seemingly at odds with some of their views about water as a commodity. Some communities (Government workers, students and NGO representatives) followed the global view, which made them think about contamination in the aquatic environment and water toxicity, the abundance of pollutants and their persistence (Armitage, Bowes, & Vincent, 2017; Cao, Song, Zhang, Wang & Liu, 2015; Chen et al., 2016; Kiguchi et al., 2017; Mandaric et al., 2017; Noorhosseini, Allahyari, Damalas, & Moghaddam, 2017). I found that the water quality of the Thimphu River was of major importance to residents, not only for drinking and other domestic purpose, but also for aesthetic, ecological and landscape values. Some of the perceptions interviewees voiced are shown in Figure 25.

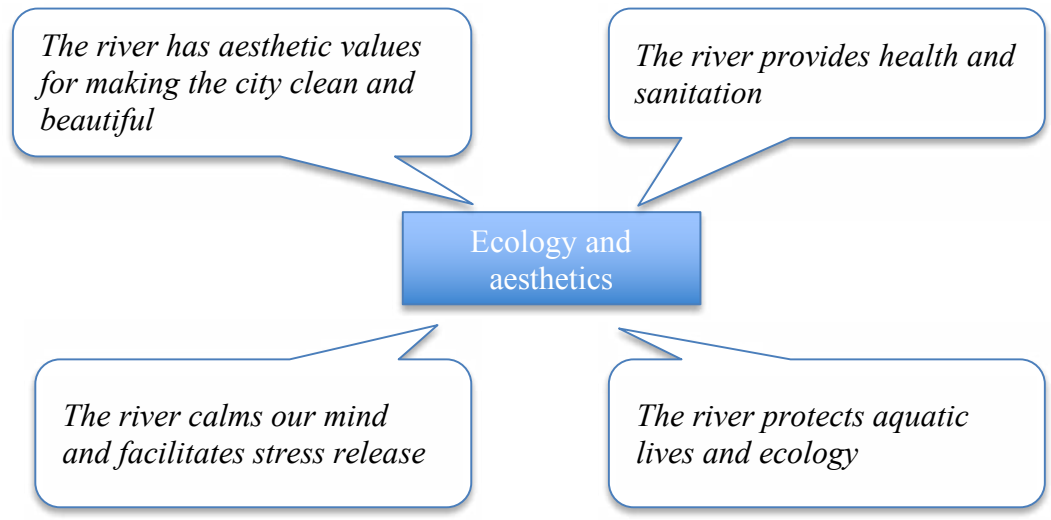

Figure 25. The Thimphu River was perceived as providing ecological, scenic, recreational and health benefits.

Corresponding behaviours of the different Thimphu communities are illustrated in Figure 26. These behaviours and viewpoints stemmed directly from values the interviewees held.

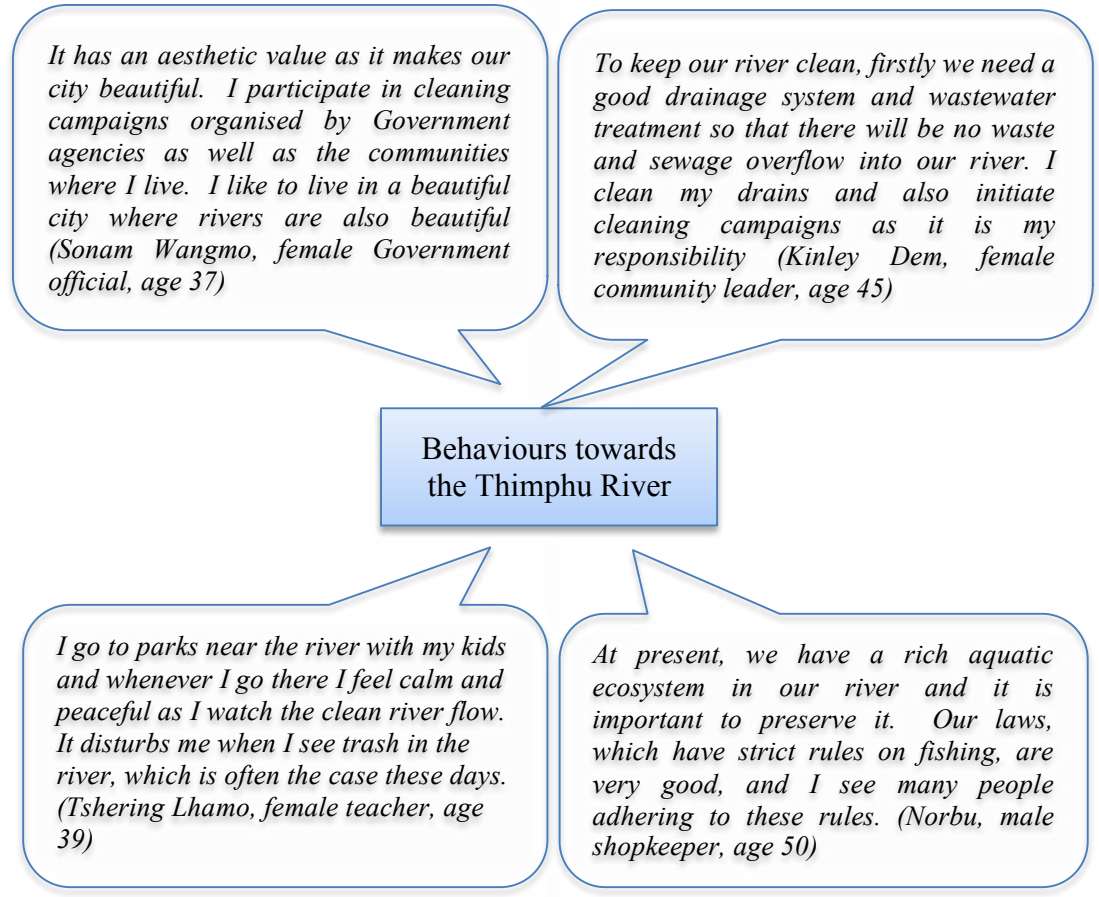

Figure 26. Behaviours associated with the perception of ecological benefits flowing from the Thimphu River.

Thus, I found that the Thimphu River was also perceived as ecologically beneficial for people and the landscape of Thimphu City. Although people voiced the opinion that the river was an important aspect in their lives, they had also noticed its degradation. It was also known by many of interview participants that protecting water quality through the improvement of wastewater treatment was important to human health and the environment. Some communities were already affected by the current level of degradation and were therefore taking initiatives.

Concerned and Caring Behaviours

I found that communities like Government agencies, students and NGOs were starting to take responsibility for the river by adopting stream reaches as their specific

concern. They were engaged in cleaning these areas of trash. Many people saw waste disposal directly into the river as a huge negative. New communities were forming via associations between schools, NGOs and Government agencies coming together. According to one interview participant, the cleaning of some stretches of the river takes place twice a month. However, I found that the current ad hoc way of carrying out cleaning campaigns was ineffective. Through my direct field observations and interview questions, I found that cleaning unconnected river reaches was inadequate and unsustainable, because more trash was thrown after the clean-up, and because clean-ups were not linked. According to the CEO of Clean Bhutan, "It is not sustainable because people tend to throw [rubbish into the river] thinking that there will be others like different institutes or schools coming to clean after them".

This problem was also the concern of students who were called upon to clean the streams and rivers. One of the students said, with some sadness, "What I do not like is that however much we try to clean, there is no improvement and no change. People keep on throwing their waste into the streams and river thinking that we are there to clean" (Lhaden, female student, age 16). Therefore, many interviewees felt concern about the imbalance between those performing cleaning tasks (students, NGOs and Government employees) and other members of the community who did not bother and who caused more problems by polluting the river with solid wastes and open defecation. Concerns about pollutants, some of which cannot be cleaned up by community groups, are detailed in Figure 27.

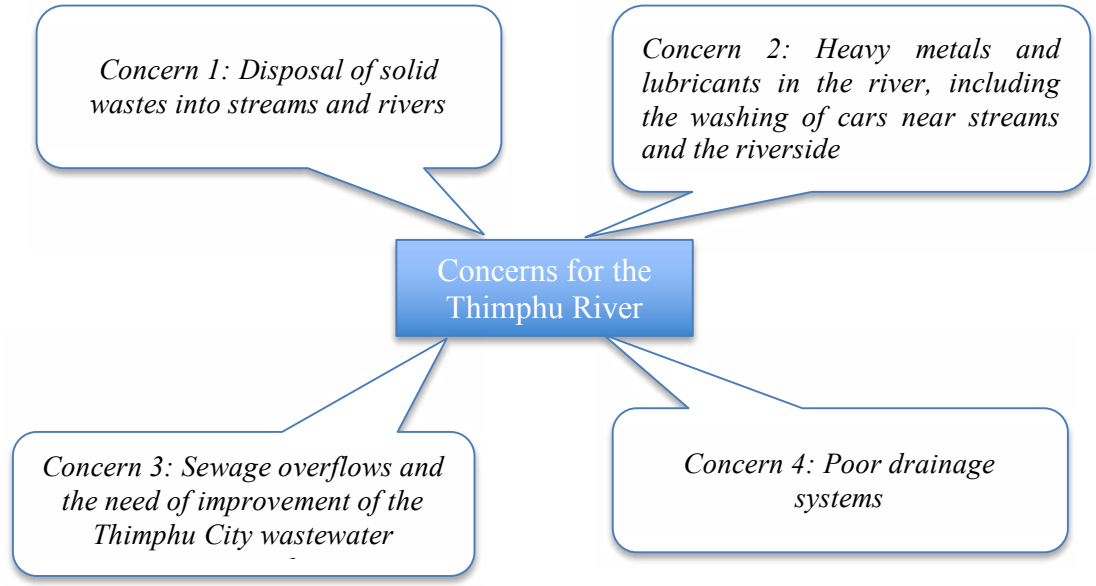

Figure 27. The four main concerns about the Thimphu River and the pollutants in it.

Because school students were the ones who were mostly involved in cleaning the Thimphu River and the city streets, I involved them in a dedicated group discussion (see chapter three). Their hopeful voices feature in Figure 28.

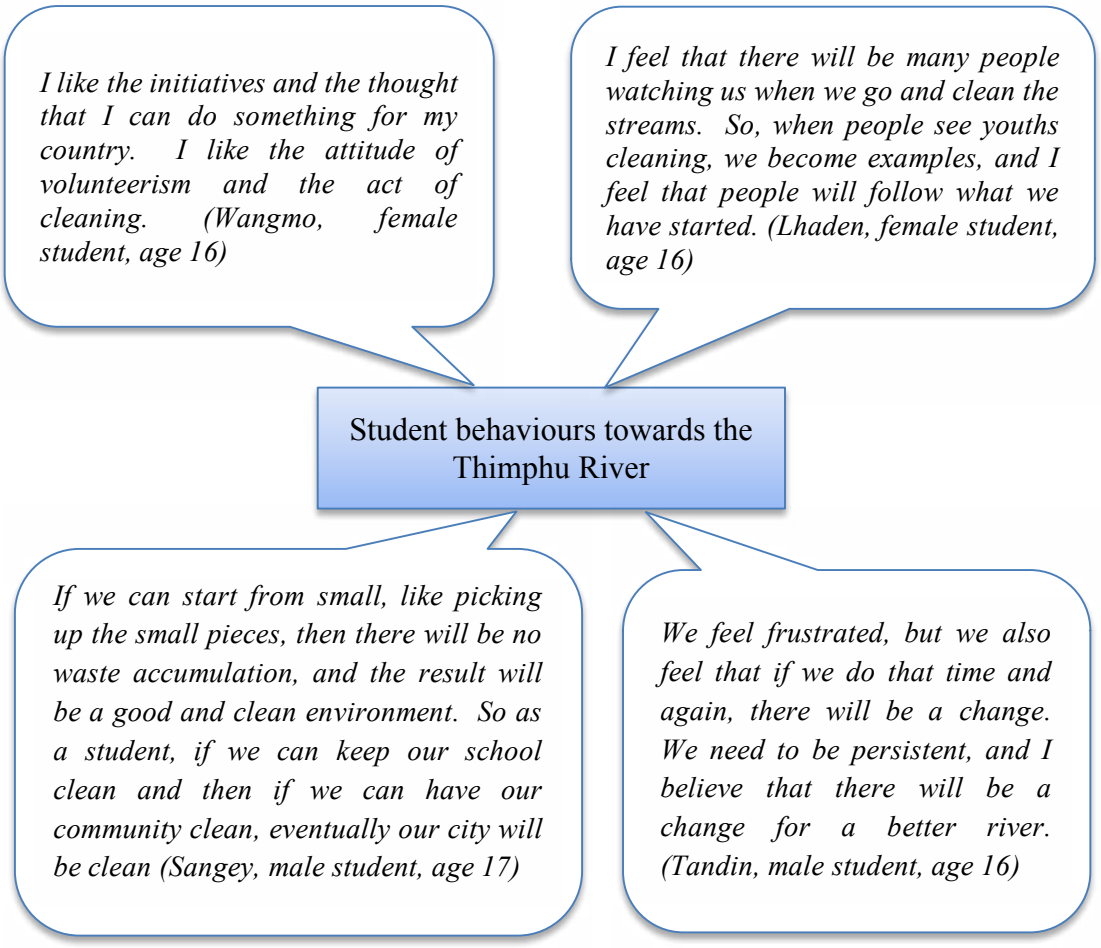

Figure 28. Caring behaviours exhibited by students towards the Thimphu River.

I understood how the students felt as I joined them in cleaning the river. Cleaning felt unsustainable because on the one hand, communities that were formed to care for the river cleaned once a month, or even twice, while other communities who did not really care continued to dispose of solid wastes into the streams and river. Some of the wastes that I observed were old clothes, old toys, pet bottles and used sanitary napkins. I saw the students and others going to great lengths in cleaning the streams, some of which had become murky. The photos I took of their activities (Figures 29–30) show the cleaning carried out by students and the wastes taken out of one of the streams flowing into the Thimphu River.

Figure 29. Students' behaviour towards the Thimphu River: cleaning one of its tributaries.

Note. Photo by author.

It was encouraging to see such activities, and when asked about their motivation to carry out such actions, the answers most gave were about improving health and sanitation, and caring for the ecology and aesthetics of Thimphu City. At the time I conducted this study, the NGO called Clean Bhutan, which is responsible for many initiatives in making Thimphu City as well as other cities in the country clean, was also trying to advocate a new concept called "sustainable consumption lifestyle" (Nedup Tshering, semi-structured interview, 2017).

Figure 30. Solid wastes collected from a tributary by students, most of which were non-biodegradable plastics.

Note. Photo by author.

According to the CEO of Clean Bhutan, Nedup Tshering (male, age not stated),

> This is one concept which we are now trying to advocate. It is about not buying things, which are not very necessary. Here people tend to buy things, which are not useful. Whenever there is a fair trade, we go and buy the junk and after one year, that thing becomes useless and it becomes a waste and then it goes to the river and the landfill. This concept is mainly focussing on reducing wastes at source. We are already advocating at different colleges and university in the country.

Mr. Tshering said he believed that this approach would take time, but that he had hopes, and he had already seen the positive effects of people becoming cautious. He said that he could feel the effects through the amount of trash he and his volunteers had been collecting over the years, which had decreased as time went on.

Traditional and Spiritual Perceptions

I found that traditional beliefs and spiritual perceptions of the Thimphu River were held mainly by Bhutanese elders. Even though GNH has its foundation in traditional and indigenous knowledge, I found that the practice of this knowledge on the management of the Thimphu River was largely absent.

For traditional Aboriginal owners in Australia, nature is not just nature, it is also culture; and culture is not just culture, it is also nature (Weir, 2009). Traditional peoples in Australia appreciate their rivers as being embedded within networks of relationships, referring to a "connectedness" or "being connected" (Weir, 2009, p.56). This is in stark contrast with modern water management that interprets river water as a mute resource — undifferentiated and unconnected (Weir, 2009).

In Bhutan, spiritual and traditional culture is interconnected with nature due to the beliefs of modern Buddhists and our ancestors, pre-Buddhists (who followed an ancient belief system called Bon)[2]. Our lives are intertwined with nature due to the various beliefs and narratives we hold about nature. Some call it "myth" and some call it "stories", but in Bhutan they blend together, and the line between fiction and history is totally blurred. I grew up believing that those stories were real; we were

[2]Both Buddhism and Bon are practiced in Bhutan today.

educated to believe in enlightened masters who can fly and perform healing miracles, and who can ride tigers and subdue demons and spiritual deities. These indigenous Buddhist and pre-Buddhist beliefs have been practiced for many years and have blended in with our culture over time. Consequently, these beliefs have significance in preservation of the environment. Figure 31 illustrates some of the traditional Bhutanese spiritual perceptions.

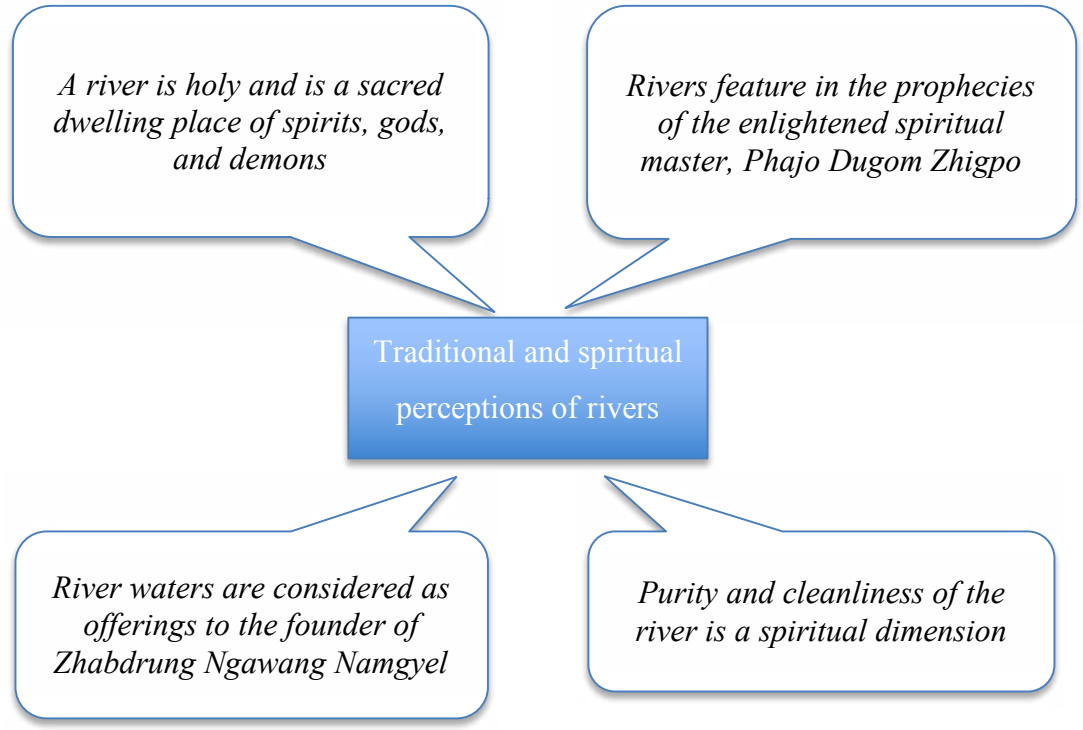

Figure 31. Traditional and spritual perceptions of rivers as held by the Bhutanese people.

To understand traditional and spiritual perceptions towards the Thimphu River, it is important to provide detailed explanations about the beliefs that the Bhutanese have about nature, which are revealed in some of the semi-structured interview narratives I collated. First, beliefs in local deities who are considered our protectors are important in mediating relationships between humans and natural resources. However, these beliefs are perhaps lost, or in the verge of being lost, particularly in the urban areas of Thimphu. Yet, holy and sacred places where enlightened masters are believed to have meditated and to have gained enlightenment, which were revered and cherished sites in the past, still lie undisturbed today. According to Ura (2004), there are spirits, gods and demons, which are called *"nep"* or "*gyep*", who protect rivers, mountains and ancient trees. If one disturbs these elements, *nep* become

enraged and are believed to bring ill luck, sickness and death to the responsible families. In contrast, in appeasing these spirits through cleansing rituals and proper care of river waters, *nep* reward their carers with luck, peace and prosperity (Ura, 2004).

Second, Thimphu River has a very important relationship with one revered master called *Phajo Dugom Zhigpo*. According to the nuns and the elderly monk who were interviewed, there are narratives as follows; "The story is about one of the spiritual teachers called *Phajo Dugom Zhigpo*, who met his wife at a log that was stretched over the Thimphu River. The bridge is now called *Lungtenzampa*, meaning a 'bridge of prophecy'". They had seven children born from one pregnancy, which was considered by the master to be an inauspicious number. The parents decided to put the babies in the river, with the hope that only the ones who would help spread the teaching of the truth would float and survive. Three of the babies drowned and four survived. The master and his wife raised them, and they grew to be great spiritual teachers who went in all four directions, North, South, East and West, to spread their teachings. Over time, the bridge of prophecy was built into a suspension bridge, and then a wider wooden bridge replaced the original log. Later, with more people moving into the city, the bridge expanded, and it now spans from the road below the flyover (Elderly monk, personal communication, 15 May 2017). Almost all older people know this story, and they place significant value on it. The area is revered and honoured, with a *stupa* built near the bridge.

Third, significance is attached to the river via Zhabdrung Ngawang Namgyel, who is the founder of Bhutan and is revered as an enlightened master. The story is as follows.

> According to history, demons tried to destroy Zhabdrung by creating a glacier lake outburst that would have flooded [the area where he was, Pangrizampa School, a school of astrology near the Thimphu River], but a mermaid who was the disciple of the Zhabdrung diverted the flood, and the lake turned into a river that now flows as the Thimphu River. (Elderly monk [name withheld], age 66)

There is a shrine where this river mermaid is still worshipped, the same place where the statue of Zhabdrung Ngawang Namgyel has been erected. Another narrative that is linked to the statue is as follows:

> There is a statue of Zhabdrung in Pangrizampa Monastery / School, which is believed to have turned itself towards the river. It is said that the Zhabdrung statue spoke, saying that in the degenerated times to come when there is no one to offer me water, this water from the river will be an offering to me. So this is why we have to keep this river clean in considering the beliefs that we have. (Elderly monk [name withheld], age 66)

Aum Kinley Dem, female, Tshogpa community, age 45 also agreed with the elderly monk.

There is also a double-trunked, gigantic tree in front of the Pangrizampa School that is believed to be a living spirit connected with the two shielding ravens that were the protective deities of Zhabdrung Ngawang Namgyel. These ravens are believed to represent the guardian diety of Bhutan.

Finally, the significance of any river lies in its purity and cleanliness, which is why water burials and the ashes of the dead are offered to the Thimphu River. While there are many reasons for offering the dead to the river, one reason is to pray that the remains of the dead will reach the holy Ganges River in India, which is considered sacred. The other reason is to provide an offering to the *"naga"* or "*lu"* (deities), who are believed to be protectors of the rivers and who still dwell in cleaner parts. Traditional people are therefore concerned about actions and substances that could offend these deities and cause pollution, which in Bhutanese terms is known as "*drib*". It is believed that the displeased deities could cause crop damage, injury and natural disasters (Ura, 2004). Behaviours towards the Thimphu River based on these spiritual beliefs are illustrated in Figure 32.

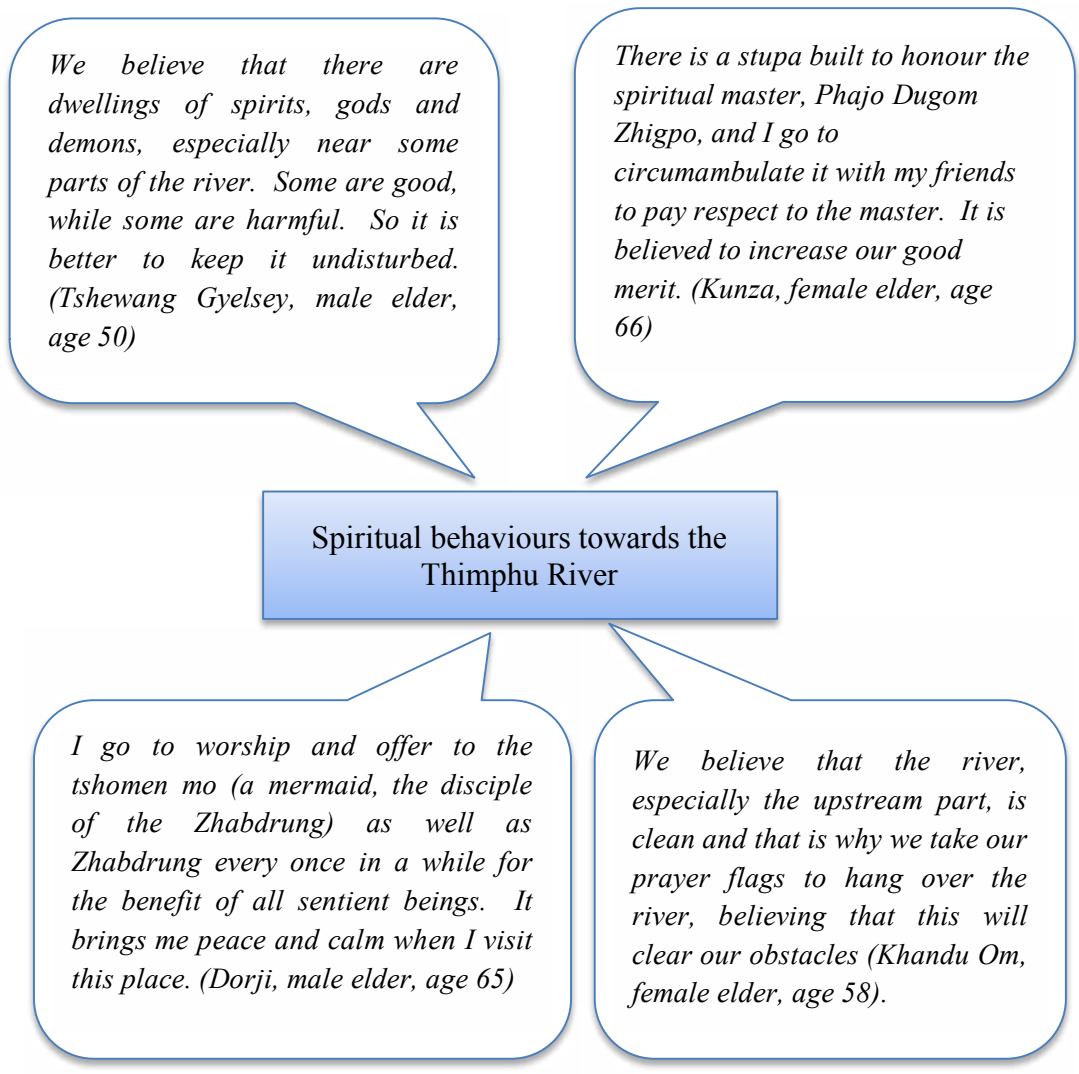

Figure 32. Bhutanese spiritual beliefs and behaviours towards the Thimphu River.

The photo in Figure 33 shows prayer flags hung over the river. Prayer wheels are also placed to be turned by the streams and rivers in the belief that the wheels will promote peace, compassion, strength and wisdom.

Figure 33. Prayer flags over the Thimphu River that are hung there to clear obstacles from human's lives.

For many elders, the river is extremely important, and they describe the river as a "precious jewel" for the country as well as for the environment and themselves. For them, the river is part of their survival as a people, and is a part of their cultural and spiritual heritage, economy and culture. To treat the river as a drain is anathema, or the same as the end of the world to them. An elder, who was once a local leader, said:

> Whatever we do, starting from cooking and washing and cleaning, depends on electricity. And the rivers, including the Thimphu River, generate this electricity, and we have to regard this as a precious jewel as it is serving the country and the people. We cook and we have the opportunity to watch television, we use mobiles and all these technologies because of the electricity, and indirectly, it is because of the river that we have. So without the river, we would be handicapped. So we are concerned when we see lots of waste in the water. (Gyeltshen, elder, age 65)

These elders related natural disasters like floods and erratic rainfall to the loss of the sanctity of the river. They believed that the local deities protecting the river were angry over the activities carried out by humans which had harmed the river. One elder farmer associated the disastrous and erratic rainfall, which had caused floods, with harmful human activities around precious water resources.

> It is important to protect our river and to stop the people from throwing any kind of wastes in the river. Times have changed now. Rainfall is erratic, and although we need rain, the rain we get is destructive rain. And these storms cause damage, which harms both the people and the Government. We really need to take care of our mountains, forests and rivers. I think we are making the local deities angry. (Farmer [name withheld], age 68)

Another farmer stated, "Our stream and springs are drying up every year, and the river that we have is becoming dirtier every year. Maybe nature is cursing us for doing something wrong, and that may be polluting our rivers and environment" (Aum Tshering, farmer, age 67). Although there is no "proof" that there are deities and spiritual protectors dwelling in the mountains, rivers or forests, there are many beliefs and values placed in nature, and these beliefs create relationships and meaning in the lives of many people.

To cultural outsiders, or even to the younger generation of Bhutanese, this spiritual connection sounds strange and superstitious. Reviving this perception of traditional and spiritual connections with the Thimphu River could be one step towards reviving a healthy urban river and in co-existing happily with other humans, however. Therefore, it may be more important to restore and rekindle our ancient Bhutanese beliefs and values, and to act on these beliefs and values.

Chapter Six: A Happy River for Happy People

In previous chapters, I have described the Thimphu River and the different kinds of relationships the communities around Thimphu have with their river. Some communities I engaged with thought of the river as a commodity, but others were concerned with the degradation they saw as caused by unethical behaviours. Some people have begun cleaning solid wastes from the Thimphu River; however, current piecemeal water resource management is not really effective. Indigenous values forming the basis of GNH are also failing to uphold river health. Chapter six examines the possibilities for improving water resource management and management of the Thimphu River. These possibilities are embedded in reconnecting with already existing traditional and spiritual values.

In chapter six, I analyse my third research objective, which is to explore and contribute knowledge to the social relationships and linkages between communities and the Thimphu River. I also answer the research question of co-existing harmoniously with the Thimphu River. Herein, I re-negotiate GNH as a community economy. Community economy themes are "taking care of commons" and "encountering others". In this chapter, I describe in detail the concept of community economy as it relates to the Thimphu River, and I negotiate Bhutan's GNH as a form of community economy.

Community Economy and Ethics

In this era of the Anthropocene, where the actions of humans have accelerated negative ecological effects on Earth by consuming non-renewable energy resources and overusing and destroying renewable ones, it has become important that we call upon new approaches and innovative forms of action. Concerned social scientists and creative scholars have come together to expand our understanding of ways to conjoin "nature and culture, economy and ecology, and natural and social sciences" (Gibson, Rose, & Fincher, 2015, p. 1). It has been known for some time that the capitalist way of life is not sustainable, and many examples of how capitalist systems have allowed people to overuse minerals, non-renewable energy, soil fertility, and plant and animal species at a rapid pace have led to environmental depletion (Gibson-Graham, Cameron, & Healy, 2013). The "free gifts" of nature have been transformed into private profits at the cost of ecocides worldwide, which threaten human survival (Gibson-Graham et al., 2013).

Realising the ill effects on the health of our planet, many ecologists and scholars have redefined economies from the ecological standpoint and have started asking ethical questions such as, "How do human and nonhuman others live together?" (Gibson-Graham et al., 2013). By asking these ethical questions, scholars are trying to reshape economies to incorporate the dynamics of livelihoods beyond the simple cut and thrust of making and maximising money. Scholars are also taking into account the "diverse forms of interdependence, complex relations of community making, and ethical negotiations of multiple rationalities and ways of living" (Gibson-Graham & Miller, 2015, p. 15). It is argued by many scholars that we need to balance our needs with the needs of others to recognise, honour and pay back the surplus we receive from the Earth and Earth others, whereby we can build ethical practices for living on this planet (Gibson-Graham, 2017; Gibson-Graham et al., 2013; Gibson-Graham & Miller, 2015; Plumwood, 2007). Many people are "taking back" the economy to make it work for societies and environments, showing deep and shared concerns and experimenting with ways of responding to destructive forces (Gibson-Graham et al, 2017).

People around the world are reframing their economies in their own ways. Many people are taking notice of the things humans do to ensure the material functioning and wellbeing of households, communities and nations (Gibson-Graham et al., 2013). This means reshaping economies to address environmental and social well-being, not just material outputs (Gibson-Graham et al., 2013). Access to health care, free time with family, conservation of natural resources and other noneconomic factors are now being seriously considered throughout the world (Revkin, 2005).

Of all of these initiatives, the concept of community economy reframes economies in the broadest possible way. The concept enables people to look beyond mainstream economic growth and is the one practice that adequately allows humans to "survive and care for each other and the earth" (Gibson-Graham et al., 2017, p. 5). Indeed, economy and ecology are not separate, but are both intertwined, an on-going negotiation of human and nonhuman relationships (Gibson-Graham et al., 2017). Thus, community economy is not just an economic form, but rather, it is the praxis of co-existence and interdependence around which economic decisions are negotiated (Roelvink & Gibson-Graham, 2009).

I argue that community concepts are similar to Bhutan's GNH, which also emphasises interdependencies between economies and the environment. For example,

GNH is about taking care of the environment based on Buddhist beliefs of enshrining interdependence and not harming others, whether they are human or non-human. In this way, GNH is a policy that seeks to take care of the commons as shared resources, thus providing a blueprint for humans to survive in harmony with nature. The concepts of community economy and GNH are so similar that some members of the Community Economies Collective have taken inspiration from Bhutan's GNH (Gibson-Graham et al., 2013). However, in the context of the Thimphu River, even with GNH guiding the country, it is clear that GNH needs re-negotiation for humans to live in harmony with their environment.

Taking Care of the Commons

Commons arise when a group of people decides how they wish to manage a resource in a collective manner, with special regard for equal access, use and long-term stewardship (Bollier, 2016). The word "commons" refers to a property, a practice, or a knowledge that is shared by a community (Gibson-Graham et al., 2013). Our survival depends on many different kinds of commons, including biophysical elements (rocks, soil, sunlight, water and air), plant and animal ecologies, cultural commons (language, musical heritage, sacred symbols and artworks), social commons (education, health and political systems) and knowledge commons (indigenous ecological knowledge and scientific and technological advancements) (Gibson Graham et al., 2013). The commons that I refer to in the current study are the biophysical and spiritual commons that comprise a shared resource, the Thimphu River.

Ever since Hardin made the phrase "the tragedy of the commons" world news in 1968, people have misunderstood that the loss of the commons is inevitable. Hardin (1968) argued that all commons, for example, a pasture used by numbers of herdsmen, are eventually destroyed because each herdsman uses the resource until the expected costs of utilisation result in equal expected benefits. The accumulated individual herdsmen's decisions result in the overuse of the common resource (Gibson-Graham et al., 2013). However, research during the past few decades has challenged the inevitability of the "tragedy of the commons" by documenting many example of successful management of common resources. In fact, communities common resources support have successfully managed their commons by constructing rules and protocols that ensure responsible use (Gibson-Graham et al., 2013). In a

community economy, people talk to one another and develop shared rules that govern access and use of resources (Gibson-Graham, 2017). People collectively take responsibility in caring for commons like land, water, forests and fisheries.

The word "commons" can be changed from a noun to a verb, "commoning"; commoning is something humans do to care for what we use and value, without necessarily owning it (Gibson-Graham, 2017). Examples of commoning include the pollution of air in Australian city of Newcastle, which was facing a "tragedy of the commons" in the 1800s. People collectively devised rules and protocols to manage and common the atmosphere through institutional arrangements and the mobilisation of technological advances. This commoning action involved residents from all social classes learning how they were affected and acknowledging the impact of living in a highly polluted environment (Gibson-Graham et al., 2016). The process was an example of taking care of the air, which we use and value without owning it.

Similarly, in Bhutan, community forest user groups are doing very well in commoning the forest (Buffum, 2012). National policies governing forestry programmes provide a range of economic, environmental and social benefits that have had a positive impact on increasing forest cover. Three forest communities in Bhutan (Yakpugang, Masangdaza and Shambayung) have managed to take responsibility for their forests through cooperative management. The commoning action in this case involved adopting rules in controlling access, which further enhanced the likelihood of communities forming effective forestry user groups and managing their forests sustainably and equitably. The indicator of success was the equity of benefit sharing, or the fulfilment of local needs (Buffum, 2012).

However, with the Thimphu River, the opposite story has emerged. Water quality testing shows that the river is facing its own "tragedy of the commons" (see chapter four for details). Although the magnitude is small on a global scale, attitudes towards the river are very similar to attitudes expressed in other areas of the world, which are "help yourself", or "feel free" philosophies (Hardin, 1998). The commoning action is present in river clean-up efforts, but it is insufficient.

Bhutan's forest user groups. To me, commoning is something we do to care for what we use and value, whereby we negotiate access, uses, benefits, and responsibilities for a resource, and whereby we distribute the benefits in ways that take into account the wellbeing of others (Gibson-Graham et al., 2016). To be a

commons, the following characteristics must be fulfilled:

- access to the property must be shared equally among a large number of people;
- use of the property must be negotiated by a community;
- benefits from a property must be distributed to the community, and possibly beyond;
- caretaking for the property must be performed by community members; and
- responsibility for the property must be assumed by community members (Gibson-Graham et al., 2013).

In the case of forest user groups in Bhutan (the Shambayung, Masangdaza and Yakpugang communities), the forest is a State property under the Department of Forest and Park Services, which was created under the Government umbrella of the Ministry of Agriculture and Forests (Buffum, 2012). But some of the forest area is managed as a commons by community forestry programmes. Access to the forest for firewood, fence posts, flagpoles and medicinal plants is shared between community forest user groups. Land use is negotiated between community forest user groups, with each group taking responsibility for managing and caring for various areas. The management committee organises regular meetings of the users to implement the work plan for the coming period. Furthermore, the government also asserts the religious beliefs of Bon and Buddhism responsible for the pristine forests and mountains. These beliefs limit the use of certain natural resources and trees (Allison, 2002).

An important activity in all community forests is patrolling to ensure that illegal harvesting or forest grazing is not taking place. In some communities, one or more forest guards are hired, while in other community forests, committee members take turns patrolling the forest on a voluntary basis. Other management activities include nursery operations, tree planting in degraded areas, thinning and pruning operations, and the creation of fire breaks (Buffum, 2012). Wood products and other medicinal plants benefit members of the community. Community forests generate income from royalty payments from the harvesting of wood products and from contributions made by visitors like local visitors and officials from different regions of the country as well as tourists. The funds are used for a variety of purposes, including providing loans to members, constructing community forest offices,

providing meals during workdays and meetings, and contributing to schools and temples. A summary of the community forests as commons is shown in Table 2 below.

Table 2

Bhutan's Community Forests as a Commons

Access	**Uses**	**Benefits**	**Care**	**Responsibility**	**Ownership**
Widely shared	Negotiated by a community	Widely distributed to community members and beyond	Performed by community members	Assumed by community members	Any form of ownership is possible (private, state, or open access)

Notes. The three forests managed in a community economy way are cared for by the Shambayung, Masangdaza and Yakpugang communities. In all three cases, their forests are owned by the State, but the forests are partially managed by their local communities. In all cases, benefits are reaped by communities and uses are negotiated by communities.

The community forestry programmes have been a success and have set examples for neighboring countries (Buffam, 2012). Community forest user groups are protecting the forest for themselves as well as for future generations, and also, in a way, they are protecting endangered animals by restricting access to community outsiders. There are traditional values and beliefs based on the Buddhist philosophy of reverence for all living beings that have characterised the lifestyle and development approach that is conservative oriented and thus emerged into protecting of animals like the tigers (Wangchuk, 2013). According to Wangchuk (2013), there are netword of protected areas and biological corridors that provide safe passage for wildlife animals that include birds and Royal Bengal tiger.

They are an example of living in harmony via negotiation, or of GNH at its best in the "real world". This type of negotiation needs to happen for the Thimphu River, too.

Tragedy of an unmanaged river. It is unfortunate that the existing commoning of the Thimphu River has resulted in the river being treated as a drain. Figure 34 shows how the upstream reaches of the Thimphu River are currently managed by a narrow range of individuals, who have privatised use, while the downstream reaches, which are degraded, remain unmanaged. The ideal commoning scenario, shown in the grey section of Figure 34, has not been achieved anywhere along the river.

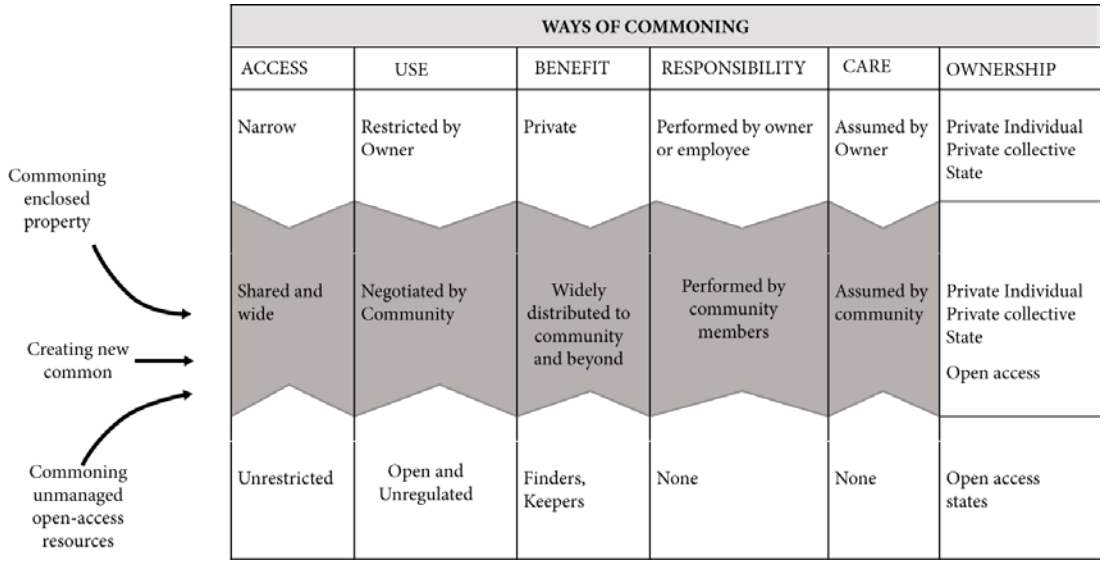

Figure 34. Commoning the Thimphu River.

Notes. Current commoning downstream is of the unrestricted variety, and sometimes, where small communities or individuals have illegally assumed ownership, commoning is of the narrow variety. The grey area is the ideal commoning scenario, but it has not yet been achieved for the Thimphu River.

River use has been restricted, or privatised along upstream reaches of the Thimphu River, where the quality of water is cleaner which accroding to the Water Act (2011), is illegal. Different communities have privatised different parts of the river, particularly the upstream reaches (Figure 34, top row). There are no Government controls, and monitoring of the delivery of water from the source to the different households is completely unregulated. Access is narrow, and use is restricted by the owners (individuals or informal water associations). The benefits are limited to users "in the know" or in favour with informal community leaders who hold informal powers. Those individuals or communities care only for that portion of the river or stream that is of benefit to them, but do not care about pollution they create for downstream users. Downstream, water quality is degraded (Figure 34, bottom row). Access is unrestricted, and use is open and unregulated. The benefits go to those who find the access by their own means (finders and keepers). No one takes responsibility in managing the river.

The ideal for the river would be some form of community regulation (Figure 34, middle grey row). For the Thimphu River to become a common with equal access for all river-dwelling communities, a structured community committee governing responsibilities, use, benefits and access must be set up as per Table 3.

Table 3

Commoning Scenarios for the Thimpu River

Scenarios	**Access**	**Uses**	**Benefits**	**Care**	**Responsibility**	**Ownership**
Scenario 1: How it could be	Shared and wide	Negotiated by all river communities with regard to the non-human	Widely distributed to community members, and possibly beyond, to non-human elements	Performed by community members upstream, middle stream and downstream	Assumed by community members with a view to spiritual connections with the river	Any form of ownership (private, state, or open access)
Scenario 2: As it is now	The entire population of Thimphu City and surrounds	Negotiated for the entire population of the Thimphu region	For the whole nation (income generation)	Performed by Government agencies, students and NGOs	According to GNH; should be the responsibility of all individuals receiving benefits	State owned

Notes. Currently, like all rivers in Bhutan, the Thimphu River is State owned. Scenario 1 shows how commoning as per the forestry model could be applied to the river. Scenario 2 shows a wider version of commoning.

Abbreviation. GNH, gross national happiness.

The Thimphu River, like any other water or natural resource in Bhutan, is State owned. According to Article 5 of the Water Act of Bhutan 2011, "Water resources are the property of the State. The rights over water resources, including the bed and banks of watercourses, shall vest in the State" (p. 3). However, my analysis of the Thimphu River showed that "access" to the river is shared by all individuals and communities living around it. Every individual has access to the river and water, with no restrictions, depending on how they are going to use the water. Use is mainly for domestic purposes (drinking, washing and cleaning), irrigation and hydropower. The benefits go to the entire population of Bhutan via electricity generated from hydropower and also through income generated by the export of electricity to neighbouring countries, similar to scenario 2 in Table 3. But the benefits to the non human others are not really recognised or acknowledged.

As emphasised in the widely acclaimed publication, *Take back the Economy: An Ethical Guide to Transforming our Communities*, "It is high time that … we become commoners and to see ourselves as active contributors to shaping the ways in which we are accessing, using, benefiting from, caring for and taking responsibility for commons" (Gibson-Graham et al., 2013, p. 147). Therefore, for the Thimphu River, it is important that the Bhutanese people recognise the river is not separate from communities depending on it, but is part of a wider community that includes many groups whose livelihoods are interdependent and interrelated with non-human elements (Scenario 1, Table 3). Community, which in other words is "being in common", can no longer be thought of as a community of humans alone (Gibson-Graham & Miller, 2015, p. 10). Commons and community go hand in hand, and the practise of commoning is key to building community economies and to negotiating ways of surviving that are true to Bhutan's GNH policy and to placing power in the hands of communities most affected (Gibson-Graham et al., 2013).

This philosophy fits in well with the Buddhist belief of interdependence and keeping the environment clean with the intention of not harming any being. Furthermore, according to His Holiness Gyalwang Drukpa, head of the Drukpa Lineage of Tibetan Buddhism, Buddhists are tasked to keep their environment clean (Vairochana, n.d.). The environment in Buddhist practices has three versions. First is the inner version of the environment, which is the mind. Second is the concept and how we look at things, and this has to be positive and optimistic. The third version of

"environment" is our outer environment, which is what we can see beyond ourselves, and it must be clean and healthy (Vairochana, n.d.). In the name of compassion and love, according to His Holiness Gyalwang Drukpa (Vairochana, n.d.), we should not wait for the problem of environmental degradation to become overwhelming, or too big to resolve it easily. That is why, as Buddhists, we must act on compassion and one approach of acting on compassion is to move and put the commoning model forestry communities adopted in place for the Thimphu River.

Encountering Others

If the Bhutanese continue on the path of destroying the Thimphu River and other waterways, we are contradicting our pre-Buddhist and Buddhist values. Currently, benefits to river-dependent communities and beyond (the river ecology and the ecosystem) are not shared, and are overlooked by the unthinking combination of upstream privatisation and downstream free-for-all pollution. The recognition of non-human entities as actively participating in making and sharing a commons, and as constituting a community alongside humans, is absent (Roelvink and Gibson Graham 2009). Thus, it is appropriate to say that "encountering others", mainly nonhuman others (the river ecosystem), must be taken into account. Downstream communities and river beneficiaries in neighbouring countries must also be thought of.

In this era of globalisation, markets have become powerful, and mediate our encounters with other people and environments that supply what we need to live well. Markets are one way to connect with others to obtain the things we need that we cannot produce for ourselves (Gibson-Graham et al., 2013). But unfortunately, these markets also disconnect people from grass-roots reality, indigenous cultures, the nature of food production and the environment. For example, we go to a supermarket to buy food, not realising or thinking twice about the hard work of farmers, the land, water and soil that grows our food. The disconnection between nature and people has become bigger over time, and we humans have become blind to our connections with nature as we pollute rivers, cut down forests and extract minerals from mountains.

However, in a community economy, ethics are attached to the market, and such ethics take into account not just the price we pay, but also the price that distant others pay, both humans and non-humans (Gibson-Graham et al., 2013). In honouring others (human and non-human), trade and market are the basis of encountering others. I find this very close to the beliefs of Buddhism where we

respect eachother as humans near or distant others and also respect the nature. And as GNH is based on equanimity, compassion and interdependence, it also echoes honouring and respecting humans and non human others. Although encountering others is not a specific domain of GNH, the approach connects well to the basic beliefs of Bhutanese people, termed "*ley jumdrey*" in the Dzongkha language, or "*karma*" in Sanskrit (meaning "cause and effect").

The very meaning of interdependence is cause and effect, which is the groundwork of GNH. The ethics of interdependence is further negotiated via ethical behaviour. For example, the ethical shopper's list makes us to step back and think about supply chains we are actually a part of, and dictates sustainable buying decisions (Gibson-Graham, et al., 2013). A farmer who values interdependent relationships between diverse plants, animal and human communities may choose to leave a large proportion of land un-cleared, which is based on an ethical decisions to recognise and respect the place and non-human others that supports his living (Roelvink and Gibson Graham, 2009). This kind of ethical behaviour can surface only when we know our connections with nature. That is why it is important to reconnect with nature in caring for the Thimphu River. One approach of reconnecting with nature would be to draw upon abstract and symbolic sources, or ''cognitive connectivity'' (May, 2006) to raise awareness of existing spiritual values that contribute to the complexity of urban river ecosystems. Examples of effective cognitive connectivity include restoration plans with strong pedagogical components, water museums, and artistic interventions that reveal ecological processes as well as indigenous and traditional, spiritual connections. The use of visual and conceptual connectivity in water management would act as a re-connection, or revival, of the indigenous knowledge that used to bind communities to the Thimphu River. Further research could be taken up for this kind of approach.

With a connection to nature firmly in place, I would expect ethical behaviour around the Thimphu River would be adopted at all levels, including individuals, communities and the Government. Table 4 shows the different kinds of ethical behaviour that, from my research and analysis, I believe would benefit the river. Table 4 compares current behaviours with ideal ethical behaviours.

Table 4

Changing Existing Behaviours to Ethical Behaviours

Existing behaviours	**Effects**	**Caring / ethical behaviours**	**Responsibility for change**
1. Washing / cleaning in the river; grey water outflow, sewage overflows	• Pollution • Ruined ecology • Low water quality • Lower water table • Reduced water safety • Upstream–downstream effects	Waste water treatment and sewage plant upgrades	Government
2. Treating the river as a drain: solid waste disposal, open defecation, pollutants from mining and industries		Education and advocacy on waste management	Individual, community and Government
3. Treating water as a commodity unequal to humans: competition for water sources (yours vs. mine) for irrigation as well as for domestic use		Water law awareness	Individual, community and Government
4. Cultural practices: water burials		Water law awareness/sky burial	Individual, community and government

In Table 4, the left-hand column summarises existing behaviours. For example, activities like grey water disposal are unregulated. Other activities — solid waste disposal, open defecation, pollution through mining and other industries, and water burials — are also unregulated. The effects and consequences on the river and its ecology are numerous and varied, and include direct impacts on the biological, chemical and physical properties of the water itself and on the riparian environment. Water quality in the Thimphu River has deteriorated, evident from low dissolved oxygen (DO) content; higher electrical conductivity; total hardness; total dissolved solids; higher turbidity; higher levels of nitrates, chloride and sulphate; higher biochemical oxygen demand (BOD); a higher total coliform count; and the presence of pollution-tolerant macro-invertebrates (Giri & Singh, 2012). These changes are due to anthropogenic activities (Currinder, 2017; Giri & Singh, 2012).

Negotiating GNH would have to involve changing existing behaviours into ethical behaviours. For example, preventing solid waste disposal and open defecation

into the river is possible at individual and community levels through recognising the spiritual and material benefits that communities get from the river. Behavioural changes would also involve honouring the river and reconnecting to our spiritual and cultural values in restoring relationships between the people and the river. Other improvements to infrastructure, such as constructing an upgraded wastewater treatment plant, drainage system and sewage processing plant, would be possible at the Government level (Table 4).

These approaches to negotiating GNH as community economy, which may work for the Thimphu River or any other river in Bhutan, may also be transferable to other nations, especially in cultures where spiritual development is part of societal transformations occurring in modern times. Thus, for the people of Bhutan, the concept of GNH is worth investing in.

Chapter Seven: Conclusion

Through working with the different communities living in Thimphu, I have examined the physical status of the Thimphu River, the connections between communities and their river, perceptions and attitudes. I have seen that materialistic values have surpassed spiritual values and have created a "disconnect" between the river and local communities, which once were connected by strong emotional ties. The river represents nature as a whole, so it can be said that the disconnection is between nature and people in a broader sense. We as humans are destroying the habitats of wild creatures and making much of the world uninhabitable. We do not realise or even seem to care that we are damaging the web of life, and ultimately, our own survival. The reason for our attempted suicide is the human–nature disconnect. When we are disconnected from the natural world, we lose our ability to feel empathy.

The focus of my study has been on attempting to understand how the balance between materialistic and spiritual values around Thimphu River can be negotiated, and what implications this would have on restoring strong connections between the river and the people. Therefore, in chapter seven, I provide a brief overview of thesis themes supporting my conclusions in the areas of negotiating GNH as a community economy.

Thesis Summary

This study began with the introduction of the study area, the Thimphu River, and the research problem, a fundamental question about living harmoniously and sustainably with a waterway that supports human existence in Bhutan. I presented options on different ways we can adopt to survive well and live within our means in harmony with our environment. My objectives were to understand and explore existing connections between riverside communities and their river; to study the attitudes of local communities towards the Thimphu River; and to explore and contribute knowledge to how we might forge new links between communities directly dependent on the Thimphu River.

Chapter two showed that with globalisation in the 1960s, and with Bhutan choosing to pursue development, a struggle between modern approaches and spiritual traditions began. These struggles are reflected in how water and rivers in Bhutan are perceived of as a commodity unequal to human beings. Unfortunately, Bhutan's GNH, a guiding philosophy founded on relationships between the environment and

people, seems to be waning. Exploring GNH as it was intended was essential in showcasing connections and spiritual values that still exist but are under threat. In chapter two, I found that the concept of GNH, which is an attempt to survive well, is not sufficient and has to be further negotiated as a form of community economy. In chapter three, I discussed methods of analysing the health of the Thimphu River. I described how GNH emerged from indigenous knowledge of human interconnections with nature. However, I found that the colonisation of Bhutanese minds with Western knowledge and science has somehow led to the disassociation of people from nature. Using a decolonising methodology was clearly the best option for answering my research questions.

Chapter four revealed how the current materialistic approach towards water management has exceeded traditional spiritual values. The balance between the two, which the concept GNH focuses on, is totally shaken. The Thimphu River is increasingly seen as a commodity for consumption and is used as a tool for economic development with no regard to human's place in the environmental web. In chapter four, I explored in detail how different communities have become disconnected from their source of life, the river. These disconnections have had consequences on how communities treat the river, described in chapter five. Due to the degraded state of the water and riparian environment, materialistic perceptions have intensified. However, a few communities and individuals have cared for the river for environmental reasons. However, I found that traditional and spiritual views were disappearing, or were tangled with materialistic concerns in negative ways for many people who seemed not to care.

In chapter six, I showed that there is a way to reconnect people with their river. In chapter six, I contributed new knowledge to how a new relationship between the river and its communities could be negotiated under the commoning approach to life. I found that Bhutan's acclaimed GNH approach is not sufficient, and that taking care of the commons and encountering others could be concepts used to restore a workable balance between humans and the environment that supports them. In chapter six, I explained exactly how the GNH policy and ways to manage rivers could be negotiated.

Final Conclusion

How we live well on this planet when it has become clear that changes in the environment are unprecedented is a daunting question. It is evident that current ecological problems, including extinctions, climate change, toxic death zones, water degradation, and many others are not just anthropogenic events — they are manmade cataclysms (Rose, 2015). Recent years have seen the rise of mechanised agriculture, the growth of cities and technological revolutions, which have introduced "modernity" to all corners of the Earth. Modernity has encouraged materialistic approaches and has also affected the climatic stability that enabled the very emergence of modernity (Gibson-Graham et al., 2015). Over the last few centuries, severe and numerous weather disasters, scarcity of key resources like water, major changes in environments, enormous rates of extinction, and other forces that threaten life are increasing. It is worrying that current responses to these challenges are focused on market-driven and materialistic solutions, and thus have the potential to further endanger our collective resources and commons. This disconnected general approach has also enhanced human disconnections with nature and the spiritual values that used to connect us with life forces supporting our own existence. The state of the Thimphu River in Bhutan showcases this trend.

With globalisation, different parts of the world are easily connected by air travel and telecommunications. Thus, it is an irony that we as humans are ever more disconnected from nature, which has proved to be bad for our wellbeing as well as for the environment that supports our livelihoods. This disconnection with nature is due to a selfish lean towards materialistic wants and a primordial neglect of spiritual values based in acknowledging humans' status as dependents on nature. I believe, after seeing and hearing the story of the Thimphu River in decline, that we need to relearn the relationship we once had with nature. In Bhutan, GNH was supposed to be a guiding philosophy for that. However, I found that while GNH works in the interests of forests and their human guardians in Bhutan, this philosophy has not been sufficient in safeguarding the Thimphu River. Thus, even in a small country like Bhutan, where connections with nature are thought to be very strong, overly materialistic approaches have overpowered our healthier connections with nature and have led to an equally dangerous disconnection with traditional spiritual values.

Ecological devastation has transformed natural resource management, but this dire situation has created opportunity to refocus our attention to new ways of thinking.

Across the globe, people are reframing their economies and their roles as humans in it in all sorts of ways, and community economy is one of the more promising departures from environmental destruction. In Bhutan, we have GNH. Even if it is not sufficient for river management, it is worth an investment to re-negotiate this concept as a community economy. Such a re-negotiation would create conditions for people to pause and reflect on their interdependence. Given the vast skills and creativity we humans have put into taming and controlling rivers over the past millennia, the possibilities are enormous if we can now become inspired to find equally creative ways to coexist with rivers by honouring and respecting our connections with nature. Recognising and realising our fundamental interdependence could be one of the most important next steps in sustaining our own survival.

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Appendix 1: Human Ethics Committee Student Application

For Office Use Only –	**HEC Reference:**
Date Received:	**Reviewers:**
Date Approved:	**Approved:** **(HEC Chair)**

Human Ethics Application Coversheet – Student

Please remember that your audience for this application form, as well as all forms for participants, will include community members and scholars from outside your discipline and therefore must be written in everyday language. Please do not delete any part of this form.

This form should be completed after reading the *Research Involving Human Participants* issued by the Human Ethics Committee available at http://www.canterbury.ac.nz/humanethics

Will another ethics committee review this application?

- If a New Zealand Health and Disability Ethics Committee (HDEC) is reviewing your project, please send your HDEC application to us with this coversheet, and then the approval. You do not need to fill out the full University of Canterbury application form.
- If you have ethics approval from another institutional ethics committee (eg another New Zealand or Overseas University ethics committee) and you will conduct your research in the country of that ethics committee, please send this coversheet only with that application and the later approval letter, and an explanatory email. You do not, initially, need to fill out the full University of Canterbury application form.

Please ***Bold*** your answers

Project Title: Understanding local perceptions and values towards Thimphu River, Bhutan.

Status of Research: Masters

Applicant
Name: **Sonam Pem**
University Programme/ Department: **Department of Waterways/ Geography**
Applicant's Email: **sonam.pem@pg.canterbury.ac.nz/sonampem.pem@gmail.com**
Primary Telephone No: **+64 27427 9848**

Primary Supervisor Title, given name and family name
Name: **Dr. Kelly Dombroski**
University Programme/ Department: **Department of Geography**
Supervisor's Email: **kelly.dombroski@canterbury.ac.nz**
Primary Telephone No:

Other Supervisors: **Julie**

RESEARCHER'S SIGNATURE:

I *[Sonam Pem]* have considered, the various ethical issues involved in this research, I have discussed this proposal with my supervisor(s), and I will conduct this research within the bounds of any approval given by the Human Ethics Committee of the University of Canterbury.

Signed: _____ Dated: 10/March/2017

Is the approval of this application a necessary pre-requisite for the Dean of Postgraduate Studies to formally accept your PhD proposal?
Yes for Masters proposal

SENIOR SUPERVISOR'S SIGNATURE

As the primary supervisor of *[Sonam Pem]* research project I, *[Dr. Kelly Dombroski]*

consider that the design and documentation are of a standard appropriate for a research project carried out in the name of the University of Canterbury.

Signed: _____ Dated: 10/March/2017

Low Risk processes (to be completed by the primary supervisor)

The low risk process for students differs from a full application only in that it is examined solely by the Chair of the Human Ethics Committee. As a result it may be possible to reply to the applicant in 7 days. It is to be signed only by supervisor(s).

Please explain why the research is low risk research low risk, noting the information overleaf

If no explanation is provided, the application will be considered a full application.

Signed (Senior/Primary Supervisor only) _____ Dated:

SUBMISSION INSTRUCTIONS.

Please submit ONE electronic file containing all the necessary documents in a PDF format and ONE fully signed hard copy. Exceptions may be made, but must be discussed first with the HEC Secretary. Processing of HEC applications is unable to begin until a hard copy of the application has been received by the Ethics Office.
Electronic copies should be emailed to human-ethics@canterbury.ac.nz. Hard copies should be sent to the Secretary, Human Ethics Committee (Level 5, Matariki South).

LOW RISK APPLICATION INFORMATION:

Research may be considered low risk when it arises from

a Masters or PhD theses where the projects do not raise any issue of deception, threat, invasion of privacy, mental, physical or cultural risk or stress, and do not involve gathering personal information of a sensitive nature about or from individuals.

b Masters or PhD level supervised projects undertaken as part of specific course requirements where the projects do not raise any issue of deception, threat, invasion of privacy, mental, physical or cultural risk or stress, and do not

involve gathering personal information of sensitive nature about or from individuals.

c Undergraduate and Honours class research projects which do not raise any issue of deception, threat, invasion of privacy, mental, physical or cultural risk or stress, and do not involve gathering personal information of sensitive nature about or from individuals, but do not have blanket approval as specified in Section 4 of the Principles and Guidelines.

3. No research can be counted as low risk if it involves:
   (i) invasive physical procedures or potential for physical harm
   (ii) procedures which might cause mental/emotional stress or distress, moral or cultural offence
   (iii) personal or sensitive issues
   (iv) vulnerable groups
   (v) Tangata Whenua (if in doubt please see the comments under question 12 on the application form)
   (vi) cross cultural research
   (vii) investigation of illegal behaviour(s)
   (viii) invasion of privacy
   (ix) collection of information that might be disadvantageous to the participant
   (x) use of information already collected that is not in the public arena which might be disadvantageous to the participant
   (xi) use of information already collected which was collected under agreement of confidentiality
   (xii) participants who are unable to give informed consent
   (xiii) conflict of interest e.g. the researcher is also the lecturer, teacher, treatment-provider, colleague or employer of the research participants, or there is any other power relationship between the researcher and the research participants.
   (xiv) deception
   (xv) audio or visual recording without consent
   (xvi) withholding benefits from “control” groups
   (xvii) inducements
   (xviii) risks to the researcher

This list is not definitive but is intended to sensitise the researcher to the types of issues to be considered. Low risk research would involve the same risk as might be encountered in normal daily life.

DESCRIPTION OF THE PROJECT

1. What does the project seek to do?

   This project seeks to understand the perceptions and attitudes of the local community towards Thimphu River by exploring different behaviours, attitudes, association and relation between the local community and the river. The project also seeks to study the quantity and quality of water of Thimphu River and the changes over the past 5 years.

2. What is the research question or hypothesis of this project?

   The research questions are: What are the perceptions and attitudes (daily practices related to water) of the local community towards Thimphu River? How do the people (individual, community, residence) link and associate themselves with Thimphu River? What are the changes of water quality and quantity of Thimphu River over the past five years?

3. Describe how this project arose ie, please explain the academic area or issue etc which generated the question(s) to be examined – this is to allow lay members of the committee some context for the research.

   Bhutan has a good policy of conservation of natural resources mainly forest, which is believed to have effects on water resources. Yet at some level, Bhutan is still facing a challenge of keeping its waterways clean especially in urban areas. The government and Non-governmental organizations are putting efforts in managing wastes and controlling the disposal of wastes into the Rivers thereby improving the urban waterways.

   However, with many developmental activities and many interests on the use of water from different sectors particularly in Thimphu, which is the most urbanised area, management on waterways seems to be overlooked by individual and community leading to deterioration of urban waterways.

Thimphu River today has been ignored and at the same time exploited by many users living in and around the vicinity. Growing population in Thimphu with increased pace of urbanization and the impact of climate change make it an increasingly complex task to ensure that communities have adequate access to clean water for drinking, sanitation, agriculture and commercial purposes. There are considerable influence on rivers and waterways by urban development. Some of the impacts are increased flood flow due to impervious areas, reduced base flow due to low ground water recharge, sediment loading, water quality degradation, channel erosion (Christchurch City Council, 2003). These impacts are already visible in Thimphu River and its catchment. The consequences of this trend would lead to further degradation of natural resources particularly water which is so much required for our daily lives. Further, this would have negative impact on the hydropower plants downstream which is the main driver for the economic development in the country.

To improve water use and management, communities need to take initiatives for which there is a need for a meaningful community engagement in management of water and its use. For this purpose, there is a need for more information about water use, values and beliefs. The community that I focus on are women and children. They play important roles in the community, yet their perspectives and voices are unheard of or often been overlooked at planning, policy and decision making levels.

Taking this into account, I intend to understand the local perceptions and attitudes (everyday practices of women and children related to water) towards Thimphu River.

Coming from Thimphu, I have a personal connection with the environment of Thimphu. Having worked in the government under the Ministry of Agriculture and Forests, I had developed an interest in community based resource management particularly in water. Water is a biggest issue in all sections of the society including drinking, irrigation, sanitation etc. Being a commoner myself in a community in Thimphu, I have experienced problems

of water, which was due to improper management at all levels starting from the community to the government agency (in this case the Thimphu City Corporation).

It was a privilege to get the admission in Canterbury University with NZAID scholarship, which would give me an opportunity to contribute to the community that I come from. I developed this project with the aim that I can further contribute in informing the policy makers thus, improving the management of the river.

4. How will you go about answering the research question?
   The research questions will be answered mainly through semi-structured interviews, Participatory Rapid Appraisal, focus group discussion, visual methods and observations.

   The third research question about finding out the actual water quality and quantity will involve getting data from National Environment Commission and Department of Hydrology.

INFORMATION ABOUT THE PARTICIPANTS

5. Who are the participants and why have they been chosen to be asked to participate?
   The participants of this study are mainly the local community like the residents, which will mainly include women and children. While the importance of access to resources and inclusion for women and children are given in many societies, the decision making level is mainly male dominant. Women are under-represented in the civil service, particularly at high levels with the most influence on policy making. This leads to undermining their needs in the overall water management issues.

   It is important to understand that water use is gendered and special

attention needs to be given to women's and children's perspectives because their perspectives are most of the time overlooked and unheard of at decision making level. Although it is said that women in Bhutan are given equal status to men in Bhutan, married and unemployed women end up being housewives. Some of these women carry out urban agriculture and sell their products to the city dwellers. There is different water use in different sections of the society, which needs to be understood.

Therefore, the study takes into account the case study approach of two organizations, individual housewives and a school. The organization is women's association called BAOWE (Bhutan Association of Women Entrepreneurs) and Zilukha Nunnery called Drubthop Goemba. As the local community also involves schools and there are schools owning some of the tributaries flowing into Thimphu River, one or two schools will also be involved for participation in the research.

The other women organization that I take into account is a nunnery called the Drubthop Goemba. Although these participants are also women, their roles are bit different from the other women. They are the religious figures in the community and are considered important and serve as role models to the grassroots women community. Although they may have the same use, the main information about beliefs and values of water and river can be collected from them.

Students are included in this research as there are small streams flowing to Thimphu River that are managed by different schools. I am interested to explore and understand the views of these students/children on the management of the streams and how they relate themselves to the streams and the river. In addition to that, I agree with Scheyvens, 2014, when she states that their voices deserve to be heard so that their interests can be served. At present, their voices are not currently heard, thus being poorly represented in decision-making level.

For the third research questions, the National Environment Commission and

the Department of Hydrometeorology will be involved because these are the government agencies, which have the data for water quality and flow and have the responsibility in managing the overall natural resources in Bhutan.

6. How many participants will be involved (of each category where relevant)? Please include statistical justification where necessary.

Target Group	**Type of Data and Method for Information Retrieval**	**Estimated Number of Respondents for Interview**
Local Residence (housewives)	Primary data through semi structured interview and questionnaire about their perceptions and attitudes towards Thimphu River.	15
Organizations • Zilukha Nunnery • BAOWE (Jungshina)	Primary data through semi structured interview for Zilukha Nunnery and semi structured interview and focus group discussion for BAOWE	10 per session
School • Motithang High Secondary School	Primary data through group activity and visual method.	10 students
Government Agencies • National Environment Commission • Department of Hydrometeorology	Secondary data through their reports and data- base.	2

7. What selection criteria and/or exclusion criteria will you use? ie, randomly, by age, gender, ethnic origin, other – please give details. What plans do you have if the recruitment phase is too successful, or does not recruit enough participants?
The participants selected for the data collection will be women and children. Womens' perspectives are often overlooked and are poorly represented in the decision making level. Although women play a very active role in agriculture even in backyard irrigation and also in washing, cleaning and

everyday activities that deal with water, there are no meaningful participation and engagement of women in decision making.

Secondly, as the streams and tributaries are owned and managed by many schools, the participants will also include students between 15-16 years old. Similar to women, the children's perspectives are often overlooked at decision-making level.

If the recruitment phase does not recruit enough number of participants, a convenience sampling strategy will then be used where there will be participants conveniently available. I will also use snowball (or chain) sample where I will firstly try to contact a focal person like a local leader (woman) and then ask her if she knows other individual women or women's association and so on. This strategy will still allow for research questions to be addressed.

I will give the participants some time to make decisions in participating in my research. I will explain to the participants (particularly residents) about my research and give them my number to call me if they agree to participate in my research. I will go to interview them only when they call me back or I will follow up with them through phone call. The same will be carried out with the focus group participants through the Project coordinator, the nunnery through the Head of the Nunnery and the school through the Principal.

8. Describe how potential participants will be identified and recruited?

For individual housewives, I will go house-to house and carry out doorstep interviews. I will give them some time to make decisions in taking part for the interview. There will be no pressure. I will leave my number and make them call me once they decide on what they want to do. As long as the housewives gives consent, I do not have any particular identification for recruitment. I will introduce myself and the purpose of my research. I will also tell them that their names will not be declared and if they do not want to participate, I will respect and accept their decision (Refer Oral script for

interviews). I will pay attention to their body language and respect their time.

For BAOWE, I will personally go and meet the project coordinator for the consent and also give them the details and purpose of the study. I will give a hard copy of information sheet and get consent form from the Project coordinator. With the consent of the project coordinator, I can then carry out focus group with the women's association. I will introduce myself while carrying out the activity and get consents from the participants as well (Refer information sheet and Oral script for focus group discussion).

For Zilukha Nunnery, I will make a visit to the monastery and make an appointment with the head of the Nunnery. I will explain to her about my study and the purpose of my research. I will give a hard copy of information sheet and get consent form from the Head of the Nunnery. I will request her to announce and explain to her colleagues and other nuns about whether they wish to participate or not (Refer information sheet and Oral script for PRA).

For the children, I will first make an appointment with the Principal of the school and explain to him/her about my study and the purpose of my research. I will give a hard copy of information sheet and get consent form from the Principal. If he/she agrees with my approach, I will request him/her to announce to the parents of the children during parent-teacher meeting prior to my next visit for data collection. I will respect the decision of the parents even if they do not consent to have their child participate. I will also get consent from the students for my methods (Refer information sheet and Oral script for visual and group activity).

For the government agencies like National Environment Commission and Department of Hydrometeorology, I will meet the focal person personally and request him or her for the data of the water quality and flow of Thimphu River. I will explain them about my study and the purpose of my research. I will follow the procedures and protocols that are deemed

necessary for getting the data from relevant agencies. (Refer information sheet for data request).

9. Does the project involve recruitment through advertising? NO (delete inapplicable) If yes, please attach a copy of all variations of this advertising (including e-advertising, eg, Facebook) and discuss any permissions that you have or might need to seek (eg, from organisers of social media/blog/comments pages).
   NO

10. How much time are participants asked to contribute to the research?
    For interviews, the participants will be asked to contribute 45 minutes to 1 hour of their time. For Participatory Rapid Appraisal and focus group discussion, the participants will be asked for 2 hours of their time. I understand their busy schedule and I will make an arrangement with them as per their convenience and free time to participate in PRA.

    For the children/students, I will request the class teacher of the particular class to assign two sessions of 1hour after class during Saturday.

11. Is any form of inducement to be offered? NO (delete inapplicable) If yes, please justify, and include the funding source for the inducements.
    No

12. How will the participants be treated? Describe in practical terms how the participants will be treated, what tasks they will be asked to perform, etc. Indicate how much time is likely to be involved in carrying out the various tasks.
    Potential participants will be given a copy of the information sheet and consent form as hard copies during my fieldwork. These forms will be verbally translated in native language, Dzongkha as most of the residents will be illiterate. If a person decides to participate in this study, she will be interviewed about her perception towards Thimphu River. If the participant prefers, the researcher will write down the details related with questions that both parties agree to be relevant to the study. During the interviews, audio-recordings will be taken using a digital device to capture their responses

accurately. In some cases where video-recording and taking of photos are deemed necessary, consent will be sought prior to their inclusion in the said recordings. Photos like water offerings, washing and cleaning (carefully avoiding faces) will be taken to communicate practices with the audience in other countries like in New Zealand.

For the PRA, the participants will be requested to draw and map out their usual day relating it to water use. They will be requested to use pens, pencils and markers and write or draw about their views and opinions on the effects of their daily activities on Thimphu River. During the PRA, audio-recordings will be taken using a digital device to capture their responses accurately. In some cases where video-recording and taking of photos are deemed necessary, consent will be sought prior to their inclusion in the said recordings. Nuns are highly literate in Dzongkha and have basic understanding of English. As some of the scripts and words in Dzongkha are complicated and difficult to understand, they will be requested to use Basic English and Dzongkha language. Therefore, a mix of both English and Dzongkha will be used for PRA.

For focus group discussion, the participants will be requested to give their opinions on the water use and management, beliefs and values, issues, their relation with water and river and their perspectives on different ways of management. During the focus group, audio-recordings will be taken using a digital device to capture their responses accurately. In some cases, where video-recording and taking of photos are deemed necessary, consent will be sought prior to their inclusion in the said recordings. For focus group, native language Dzongkha will be used which will be recorded and later transcribed.

With the students, visual method and group activity will be used. The participants in this case will be students of age 15-16 years old. I will use the method as used by Einarsdóttir, 2007. With a group of 10 students, I will go on a tour to see the stream that they manage as school and make them in-charge of the tour explaining about their views on why they manage the

streams and what they do with the stream, what they learn from managing the stream, what they enjoy and what they do not like. I will take a digital camera and I will make them take pictures of what they will show me. In this way, the students will lead the data gathering and they can make choices about what to photograph, which will make them pick out things that are of importance for them. I will print the pictures later in the day and then next session we meet, we will discuss about the pictures, what's in the pictures and why they took the pictures. The pictures will direct the interview and the conversation will be recorded and transcribed. An extra set of photograph will be made for the children as a memory of the research. During this activity, audio-recordings will be taken using a digital device to capture their responses accurately. In some cases, where video-recording and taking of photos are deemed necessary, consent will be sought prior to their inclusion in the said recordings. All participants will also be given the opportunity to check the transcript and/or notes of their interview.

13. Will forms for participants need to be translated? YES/NO If yes, what language?

    Yes, most of the forms will be translated in native language, Dzongkha. In Bhutan, the scripts and words of Dzongkha are sometimes very difficult to understand and to write even to the officials. So, it is easier for most of the literate people to use English. Verbal Dzongkha is easier than writing in Dzongkha. Therefore, the forms will be only verbally translated and not in written. Even in written, the residents (housewives) will not be able to understand the forms. So it will be easier for the researcher to verbally translate the forms to all the participants.

    For school students and government agencies, the forms will be in English.

14. Will the project require engagement and consultation with iwi Māori? YES/NO (delete inapplicable) *If the answer is yes to any of the questions below, please contact the research consultant Maori. The consultant will be able to help you assess whether you need to seek consultation and engagement with iwi Māori through the Ngāi Tahu Consultation and Engagement Group. The consultant will*

facilitate the engagement process, and provide cultural advice and support. Contact details for the research consultant and other important information and advice regarding engaging with Māori are available at http://www.research.canterbury.ac.nz/maoriresearch/

- Will the design, implementation or outcomes of the project have implications for iwi Māori?
- Will there be significant Māori content, use of culturally sensitive material or knowledge?
- Will the research require access to Māori sites, or sampling of flora/fauna?
- Will there be Māori participants or subjects?
- Will the ethnicity of participants be recorded and likely to result in different treatment for Māori participants during the study or result in statements specifically about Māori in the results?

NO

OTHER PARTIES WITH AN INTEREST IN THE RESEARCH

15. Does the project require permission of an organisation, other people, to access participants or information? YES/NO (delete inapplicable) eg, parents, guardians, school principals, teachers, boards, responsible authorities including employers, etc. If yes, please explain how this approval has been or will be obtained, enclosing copies of relevant correspondence. *Please ensure forms make the employers/organisations aware that even once they have given permission in principle to give you access to participant information, they will not be able to provide this until you have obtained agreement from the participants themselves.*

Yes. To get access to the women's association (BAOWE), consent from the Project Coordinator will be obtained by meeting him or her personally. If required a formal letter of request for permission will be sent to the Project Coordinator (Formal letter included below).

To get access to the nunnery organization, consent from the head of the nunnery will be obtained. A formal letter of request will be sent to the head of the nunnery or even to the head of the Bhutan Nunnery Foundation if required (Formal letter included below).

To get access to the students, I will request the consent from the Principal of the school and request him/her to get consent from the parents during the parent-teacher meeting.

For the government agencies, I will contact them personally for the data of the water quality and flow of Thimphu River. There may be a need for a formal letter to request for the data, which I will send to the relevant agencies. I will explain them about my study and the purpose of my research. I will follow the procedures and protocols that are deemed necessary for getting the data from relevant agencies (Formal letter below).

16. Will the project require Community consultation? YES (delete inapplicable) ie, will it involve largely one community or that community's resources, or is it likely to result in different treatment for a community or result in statements specifically about a community in the results (eg, a geographically bounded community, a community of like-minded individuals, a community of hobbyists, employees)? A useful, though not exhaustive test of whether a community ought to be consulted, is whether that community has a leadership group that can be consulted. Once approvals are obtained please forward copies to HEC. *Please note: the HEC understands that in many cases consultation is informal, and does not produce official approval documents. In such cases, simply note with whom consultation has taken place, why it is those particular bodies, and include their contact details of those with whom you have consulted.*

    Yes. The study takes into account more than one community. Consultation with them will most likely be informal but will be conducted during the day or on the first day of arrival at the site. Through authorised representatives like the Principal of school, Head of the nunnery and Project coordinator of the women's association (BAOWE) a confirmation and consent will be sought prior to any face-to-face meeting. The procedures for consultation might change, to be culturally appropriate.

17. Is the project funded externally? YES (delete inapplicable) If yes, please provide details and discuss any conflict of interest issues that may arise.

Yes. The main funding for this research is from the New Zealand AID Scholarships under the Ministry of Foreign and Trade. There are no foreseen possible sources of conflict of interest.

18. Is the project commissioned by or carried out on behalf of an external organisation(s)? YES/NO (delete inapplicable) If yes, please identify the organisation(s) and any Intellectual Property agreements. This includes ownership of data, results and publications.
    No

19. Is the project to be part of the CEISMIC digital archive? If so, please ensure all participants are made aware of this, and have filled in the UC CEISMIC Quake Studies consent form. See www.ceismic.org.nz.
    No

DATA COLLECTION

20. Does the project involve a questionnaire? NO (delete inapplicable) If yes, please include a copy. The HEC does not normally approve a project which involves a questionnaire without seeing the questionnaire, although it may preview applications in some cases where the production of the questionnaire is delayed for good reason. If there is a questionnaire, please answer the following questions:

    (a) Explain how and why the questionnaire(s) will be anonymous or confidential (Anonymous: you could ***not*** conceivably know who completed it; Confidential: not anonymous, but you will not reveal the identity of the participants to anybody outside the research team)

    (b) Explain how the questionnaire will be distributed and collected.

21. Does the project involve a structured or semi-structured interview? YES (delete inapplicable) If yes, please list the topics or the specific questions to be covered.

Yes.

Semi –Structure Interview Questionnaire are as follows:

RESEARCH QUESTION 1

To answer the sub question 1: What are the different practices and behaviours of communities surrounding Thimphu River?

1. What is the different water uses in a day? Is it the same everyday?

2. Does the use of water change seasonally?

3. Are there any problems that you face with water? (Water quantity/quality) If yes how do you fix the problem?

4. Do you know where your drinking water comes from?

5. Do you know where your sewage goes?

6. How important is Thimphu River to you? Why?

To answer the sub question 2: What do the communities think about the present situation of the river?

1. How would you feel if the river is polluted or dries up?

2. When was the last time you went near the river? Why?

3. What do you think about the water quality of the Thimphu River?

4. What do you think about the water quantity of the Thimphu River?

5. Do you think there are effects of your activities in your household on the River? If yes why and how?

To answer the sub question 3: How do the communities use the river (recreational use, cleaning/washing purpose, aesthetic, nature and scenery, sanitary maintenance, water quality and water safety and others)?

1. How do you use the river?

Recreational/Fishing

Cleaning/washing

Aesthetic

Nature and scenery

Sanitary

Water quality and safety

Others

To answer the sub question 4: What do the communities think about the ecological values of the river?

1. Did you see any fish or other aquatic animals in the river?

2. When was it that you last saw fish or other aquatic animals in the river?

3. What do you know about the ecology (fish and aquatic lives) of the river?

4. Do you think there are many freshwater fish and aquatic lives in the river?

5. Do you that these should be preserved and protected?

6. What do you think should be the measure to preserve these aquatic lives of the river?

To answer the sub question 5: What are the impacts of use and misuse of the river on economy?

1. Do you think you are using the water and the river properly? How?

2. Do you think you are misusing the water and river? How?

3. Are you concerned about the river?

4. Do you know that it generates the highest income for our country through hydropower plants?

RESEARCH QUESTION 2

To answer the sub question 1: How do the different communities associate, relate and link themselves with the river?

1. How important is Thimphu River to you? Why?

2. If you think it is important to you when and how have you realized?

3. What is the importance that you see and feel about Thimphu River?

4. What are the different activities that you do that need the river?

5. What are the different activities that you do will affect the river?

To answer the sub question 2: What are the beliefs and values that the communities have towards the river? How do they preserve the values?

1. Do you have any beliefs about the water and the River?

2. If yes, what are they?

3. Do you value the beliefs and the River?

4. Do you think these values and beliefs are preserved?

5. If yes, how and by what means?

RESEARCH QUESTION 3

To answer the sub question 1: What do the community think about the present quality and quantity of the river?

1. In your opinion, do you think the quality and quantity of the water in Thimphu River has changed over the past few years?

2. If yes, how?

3. If no, why?

To answer the sub question 2: What have been the changes that they have seen over the years surrounding the river?

1. What all changes have you seen over the years around the River?

2. Do you think it is good or bad? Why?

3. Do you think there is any effect on the changes on the River?

To answer the sub question 3: What is the actual flow and quality of the river over the past 5 years?

Get data from National Environment Commission and Department of Hydrometeorology.

22. Does the project involve an unstructured interview? NO (delete inapplicable) If yes, please list the topics to be covered.

    No

23. Does the project involve focus groups? YES (delete inapplicable). If yes, please include a copy of the confidentiality agreement all participants will sign or explain the way that you will protect the confidentiality of participants.

    Yes. During the focus group discussion, I will ask the participants to not share personal information outside the group.

24. Does the project involve recording of Audio, Video or Images? YES (delete inapplicable). If yes, please explain the purpose and describe the recording. Please ensure information sheets fully inform participants of the extent and nature of the recording, and explain the legal and ethical issues of ownership of these recordings and how you have resolved them.

    Yes. Situation where participants will give consent for recording, interviews will be audio-recorded to ensure data accuracy. I will then personally transcribe the audio-recorded interview when I am back in New Zealand. Some processes related to interviews, focus group discussion, Participatory Rapid Appraisals and visual methods, are better understood through videos, images and recordings. However, consent from participants will be sought prior to their inclusion in any of the said recordings.

25. Will participants will be given the opportunity to check the transcript and/or notes of their interview/focus group? NO (delete inapplicable) It is normal practice to give participants the opportunity to review their transcription. If this is not to be the case, please explain why you believe it is not necessary. Participants must be informed of interview recording both in the information sheet and at the time of the recording, and the process by which they can review the related transcription. *Please note that transcripts of focus groups may raise privacy issues (particularly if the participants are children, since other parents will see comments by children who are not their own).*

    No because there is limited time at the site and it may not be possible to transcribe the interviews, focus group, PRA and all the data. As it is planned to transcribe the data back in New Zealand, the participants may not have the opportunity to review their transcription. However, if they ask for their transcription, I will tell them that I can send the transcription after I reach New Zealand. But it is most likely that the participants will not ask and bother about the transcriptions.

    Participants will be informed about recording both in the information sheet and at the time of the recording.

INFORMED AND VOLUNTARY CONSENT

Please note: The HEC recommends that participants receive an information sheet, which they must be able to retain, unless there are good reasons for not adopting such a procedure.

The information sheet(s) and the consent form(s) should be separate. Projects which **only** involve an anonymous questionnaire may not necessarily require a separate information sheet, provided that the questionnaire includes your name and contact number as well as the other points contained in the information and consent templates available on the HEC website. *Please note: so that participants can retain a copy of the information sheets, the information sheet(s) and the consent form(s) should be separate.*

26. By whom and how will information be given to potential participants? Please attach a copy of the information sheet and consent form (if email/internet, please provide a screen shot), or the oral briefing script. Also, please set out in precise detail the processes used to obtain consent, and ensure that those processes allow the participant the opportunity to say no or withdraw without stress, embarrassment or difficulty. Where you do not intend to gain written consent, (ie, where you will rely on oral consent etc) please justify and explain how you will gain consent.

In the case of the participants from the women's association (BAOWE), the nunnery, the Principal of the school and the government agencies, a hard copy of the information sheet and consent form will be given in person. For BAOWE, housewives and the nunnery, there will be verbal translation of the information sheet and the consent form, as it will be difficult to translate in written Dzongkha. As explained, the scripts and words in Dzongkha is complicated and difficult to understand, it will be easier for myself, the research assistant and the participants to translate the forms verbally from English to Dzongkha.

For the participants like children, the information sheet and consent form will be provided as hard copies during my fieldwork. And if they have any questions, I will explain to them in both Dzongkha and English.

Prior to any on-site activity, courtesy meetings and interviews will be held with the representative of each organization. Please see attached copy of the information and consent sheet.

27. Are all participants competent to give consent on their own behalf? YES/NO (delete inapplicable) As a rule, children and young adults under the age of 16 years (or 18 years if still at school) will require parental consent to participate in your research, as do adults who have impairments that limit their capacity to represent themselves. All such participants unable to give consent should still receive a suitable information sheet and assent form where practicable. It is possible in some cases that respect for the autonomy will override concerns over ethical and legal competency, but these are rare and require much justification, and usually only arise in the context of a general community approval to waive competency requirements.

    No

    If no, please explain,

    (a) why they are not competent to give informed consent on their behalf?

    In case of participants from school, the students are mostly between the age of 16 -18.

    (b) how consent will be obtained in the absence of that competency?

    I will request the Principal of the school to get the consent from their parents during parent-teacher meetings.

    (c) if applicable, how will assent to participate be gained?

    If the Principal agrees to my research plan, it is most likely to get consent from the parents. I will request the Principal to announce my fieldwork to the parents during parent-teacher meetings.

PRIVACY AND CONFIDENTIALITY

28. Will information pertaining to or about the participants be obtained from any source other than the participant? NO (delete inapplicable) If yes please state:

    No

(a) the identity of the third party or parties.

Not Applicable

(b) why such information is needed.

Not Applicable

(c) how will you obtain consent from the participant and the third party(ies) to gather that data. Please ensure the information sheet is very clear about any data gathered about participants from third party participants, and how you intend to gain permission to see the data.

Not Applicable

(d) the processes you will use to obtain that data. If you are using recruitment strategies that access potential participants via a third party, please discuss your specific methods here. In general, it is not legal for your participants to give private contact details of other people to you. Usually, should you wish to snowball recruit, you should give your participants an information sheet or advertisement that they can give to others, in the hope that those third parties will then contact you.

It may happen that by virtue of your job, you have right of access to information concerning the participants. Where information has been collected from individuals for a purpose other than your research, it is probable that potential participants will need to be informed that their agreement to participate may involve such use. Guidance on privacy can be found in the polices of the University, and on the website of the Privacy Commissioner.

Not Applicable

29. Is information that identifies participants to be given to any person outside the research team, or if identification of or attribution of comments by participants is sought, please explain how and why. YES/NO (delete inapplicable). If yes,

please explain how and why and include this in the information and consent forms.

No. But some people like the Principal of the school or the Project Coordinator of BAOWE and the Nunnery like their names to be acknowledged. In cases where they like to be mentioned, their identification will be used.

30. Please explain how confidentiality of the participants' identities will be maintained in the treatment and use of the data. eg, the HEC expects that researchers will attempt to ensure that stored data is separated into identifying data (eg, consent forms, coding forms), and de-identified (eg, coded data, de-identified transcripts): typically this is done by assigning participants a code on the consent form, and using that code on any data, transcripts, etc. Where this is too difficult, please explain why.

    I will ensure that all forms that contain identifying information about the participant (i.e, signed consent forms, coding forms) and de-identified data (coded data, de-identified recordings and transcripts) will be stored separately on my laptop in different folders with different codes on daily basis. This will be done very carefully.

31. Is an institution (eg, school, business, etc) to which participants belong to be named or be able to be identified in the publication or presentation of this project? YES/NO (delete inapplicable). If yes, please explain whether you have made the institution aware of this or why you have decided not to do so.

    Yes. I will obtain consent. Most likely they would like their institution's names like BAOWE and Drubthop Goemba to be in the publication. They will feel that their voices will be heard.

32. Where will the project be conducted? It is recommended that interviews be conducted in public spaces, not in private homes. *The committee appreciates that in some cases there may be good academic reasons for conducting research in private homes. If you believe this applies to your project, we ask you to provide (a) a concise justification of why research in the home is necessary for your project, what alternative locations were considered, and why they were*

discounted, and (b) detail how you anticipate and will seek to mitigate potential risks to both participants and researchers when undertaking research in a private home(s).

Please note: in the case of research involving children, young adults and participants who need particular care, an adult other than the researcher is required to be present.

In case of the participants from the women association (BAOWE), I will carry out focus group discussion in a meeting room, which I will rent. For the nuns, I will carry out PRA in their own meeting hall and pay them the rent for the meeting. For the individual housewives, the interviews will have to be conducted during the time that suits them best: either in their private homes, public space. For the school children, I will take permission to use their class or their auditorium. In case of the government agencies, which are to get the data of water quality and flow, I will use their office space if given the permission.

RISK

If the answer to any of the following questions is "Yes", please indicate briefly the nature of the risk and what actions you could take, or support mechanisms you could rely on, if a participant should become injured, distressed or offended while taking part in this project. In order to maintain a distinction between the researcher and other roles, support should not be undertaken by researcher. At the very least, a list of support services should be included in the information sheet and also participants made aware of the possibility in the information sheet.

33. Is there any risk to physical well-being? NO (delete inapplicable) If yes, describe processes in place to mitigate this/these risk(s).

    No

34. Could participation involve mental stress or emotional distress? NO (delete inapplicable). If yes, describe processes in place to mitigate this/these risk(s).

    No

35. Is there a possibility of causing moral or cultural offence, inadvertently or otherwise? NO (delete inapplicable) If yes, describe processes in place to reduce the possibility of causing such offence, and any consultation/awareness training undertaken.

    No

36. Is deception involved at any stage of the project? **No** NO (delete inapplicable). If yes, please describe the deception, justify its use.

    Please note: the HEC considers the use of title in the documents for the participants that is designed to hide the real aim of the project, a deception however mild.

    Please attach the debriefing sheet or script that you will use to debrief each participant after they have participated in the project or at the end of the project itself. Ensure that the debriefing sheet includes an explicit reminder that the participant can withdraw without penalty given the deception involved.

37. If yes, please describe the deception, justify its use and attach the debriefing sheet or script that you will use to debrief each participant after they have participated in the project or at the end of the project itself. Please ensure that the debriefing sheet includes an explicit reminder that the participant can withdraw without penalty given the deception involved. The use in the information sheet or consent form or questionnaire of a title that differs from the project title given in this application form, in order not to reveal the real aim of the project, is considered to be a form of deception however mild.

DATA STORAGE AND FUTURE USE

38. Please provide details of how the data will be securely stored, and how you will separate identifying and non-identifying data. ie, what steps will be taken to ensure that information given by participants is safe and protected? All storage facilities including electronic equipment should be in rooms that can be locked. All data should be stored in password-protected files and, where on computers, the computers should be password protected. Data should be backed up or stored on the University servers. If you intend to store the data in cloud services please

provide a justification and documentary proof that the data will be secure (eg, relevant sections of the terms of service of the provider).

Hard copies of interviews, drawings, pictures, charts and interviews and signed consent forms will be stored in a locked filing cabinet in my office in the University. Soft copies of transcripts and recordings will be stored electronically on UC servers as password-protected files.

In the field, I will use a voice recorder and my mobile phone for video recording (PRA) for collecting all the data, which will be downloaded on my laptop. My laptop will be protected with a security password. After downloading the data on my laptop, I will send the data to my email address for backup. I will always make sure that for all my fieldwork, I will have a backup so that I do not miss any data.

39. Who, apart from the researcher and their supervisor (where applicable) will have authorised access to the data? Research Assistants and transcribers need their own confidentiality forms and their participation needs to be made known to participants.

    None

40. What will happen to the raw data at the end of the project? Standard HEC principles are that data from research projects will be kept safely and then destroyed as follows:
    - At the completion of an Honours or similar project
    - After 5 years for an MA
    - After 10 years for a PhD or staff research

    Please discuss and justify any variations to these guidelines that your project requires (for instance, if the data is to be kept permanently).

    This information should be contained in all information sheets and consent forms.

    The data will be kept safely with me securely for 5 years.

41. What plans do you have for the publication of the data? Please note, and include in your information sheets, that Masters thesis and PhDs are public documents

available via the UC library database. Also, participants should be offered summary of results.

It is aimed that there will be at least one submission made to a peer-reviewed journal. Results of this project may also be used for conference presentations.

Participants will also be offered a summary of results of this project. A thesis is also a public document that can be viewed through the UC Library database.

42. Please describe plans for future use of the data beyond those already described above.

There are no other plans for future use of the data beyond those already described above.

Appendix 2: Formal Letter of Request to Research Participants

Understanding local perceptions and values towards Thimphu River, Bhutan

Letter to the Head of the Departments of Target Organizations (School, BAOWE, Nunnery and government offices (National Environment Commission and Department of Hydrometeorology)).

Dear (*Principal/Project Coordinator, BAOWE/Head of Nunnery/ Head of Department),*

My name is Sonam Pem. I am currently doing my Masters in Water Resource Management at the University of Canterbury, Christchurch, New Zealand supported by New Zealand Aid Scholarship.

NZAID highly recommends for scholars like me to work on topics that would be valuable to our home countries, and I decided to look into water management focusing on Thimphu River. In line with this, I have decided to explore the different perspectives of local community particularly focusing on women and children. It is evident that the decision making level is male dominant in our country. This tends to overlook different perspectives particularly from women and children. Given the importance to women and children by the government of Bhutan, I feel that my research is appropriate for your organization (name of the organization).

With this background, I would like to request you for your permission to include your (students/women from women's association/nuns from the nunnery/relevant staff from your Department) to kindly participate in my research.

The main tasks to be performed throughout this research include (participatory and visual methods for students/ focus group discussion for BAOWE/PRA for nuns and data collection from the Department). There may also be semi-structured interviews. It is estimated that the tasks as mentioned above will take (two sessions of one hour for students/1 hour for focus group discussion/2 hours for PRA /45 minutes to 1 hour for staff of Departments) of their time. Additionally, I will also be conducting site observations to better understand the case studies.

The research project is funded by NZAID. Dr. Kelly Dombroski and Associate Professor Julie Abbari from the University of Canterbury will supervise me. For more details, attached herewith is a PDF file of the **personal information sheet and consent form** that shall be given to each prospective respondent. As stated in the attached document, **participation in this research project is entirely voluntary**. All data will be kept confidential and the names of participants will not be named in any publication without written consent.

I will be happy to answer any questions and clarifications regarding this matter. You may send queries by replying to my e-mail sonam.pem@pg.canterbury.ac.nz.

I hope that you and your team would be able to share your experiences with us. Kindly advise if you have comments or suggestions on how to best proceed.

Thank you very much.

Sincerely,

Sonam Pem

Attachment: Personal Information Sheet & Consent Form

Appendix 3: Information Sheets for Participants

Information Sheet for the Principal of the Participating School

(Note: English has been simplified and the discussion will be mainly in Dzongkha to ensure better understanding. Written Dzongkha is difficult and complicated to understand by most ordinary people in Bhutan. Written Dzongkha is mostly restricted to religious use).

Department of Waterways, College of Science
Telephone: +64 274279848
Email: sonam.pem@pg.canterbury.ac.nz

Understanding local perceptions and values towards Thimphu, River, Bhutan

Information Sheet for Participants

Dear Sir/Madam [School Principal and name of school],

My name is Sonam Pem, and I am a Bhutanese postgraduate student on the New Zealand Agency for International Development (NZAID) Scholarship Programme, earning my Master's Degree in Water Resource Management at the University of Canterbury, New Zealand.

The objective of my research is to explore and study about the perceptions and attitudes of the local community towards Thimphu River and to explore about the relations and linkages between the communities and the River. The study will also cover the water quality and quantity of the river and the changes that it has been facing over the past years.

Because your school is involved in caring for streams that contribute to the Thimphu river, I would like the consent of the Principal of the School so that I can invite school students to participate in my study. I would like to interview interested students and involve them in two group activities. The first activity will involve students taking

pictures related to water use and how they manage and clean the streams and Thimphu River. For the second group activity, I will print the pictures taken by the students and the students in the next session will be asked to give their opinions on their relations with the Thimphu River with the pictures. The pictures will be given to the students at the end. A teacher can be present and assist the whole time as appropriate. This activity could be incorporated into the students' science classes, if possible and appropriate.

In the second group activity, and in interviews with teachers and students, an audio recording will be taken using a digital device to capture their responses accurately. In the group activities, I would like to use video recording and photos to collect relevant information. It is estimated that the interviews will take approximately between 45 minutes to an hour, and the group activity will take 1 hour for each of two sessions.

Participation is voluntary and you have the right to withdraw at any stage without penalty. You, or the students, may ask for the raw data to be returned or destroyed at any point. If you or they withdraw, I will remove information relating to you or them. However, once analysis of raw data starts on 30/June/2017, it will become increasingly difficult to remove the influence of their data on the results.

The results of the project may be published, but the name of the individual students and the school may be assured of the complete confidentiality of data gathered in this investigation: their identity will not be made public without their prior consent. To ensure anonymity and confidentiality, their information as a participant will be coded. All of the information that they provide will be transcribed and secured in password-protected digital files at the University of Canterbury. Further, if they agree to take part in this study, they have the right to refuse to answer any of the questions. If they withdraw, all information they have provided will be destroyed.

Please indicate to the researcher on the consent form if the school would like to receive a copy of the summary of results of the project.

The project is being carried out as a requirement for Master's Degree in Water Resource Management by Sonam Pem under the supervision of Dr. Kelly Dombroski

and Julie Clarke who can be contacted at kelly.dombroski@canterbury.ac.nz and julie.clarke@canterbury.ac.nz. They will be pleased to discuss any concerns you may have about participation in the project.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

You can also contact my research assistant (his/her details) for further complaints or information.

If you agree to participate in the study, you are asked to complete the consent form and return.

Sonam Pem
[Sonampem.pem@gmail.com/sonam.pem@pg.canterbury.ac.nz)
+975-17640540]

Information Sheet for the Head of Drubthop Goemba / Zilukha Nunnery

(Note: This form will be translated into formal Dzongkha)

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Department of Waterways, College of Science
Telephone: +64 274279848
Email: sonam.pem@pg.canterbury.ac.nz

Understanding local perceptions and values towards Thimphu, River, Bhutan

Information Sheet for Nunnery Participants

Dear Venerable,

I am a postgraduate student under the New Zealand Agency for International Development (NZAID) Scholarship Programme, which provides support towards earning my Master's Degree in Water Resource Management at the University of Canterbury, New Zealand.

The objective of the study is to explore and study the perceptions and attitudes of the local community towards Thimphu River and to explore about the relations and linkages between the communities and the River. The study will also cover the water quality and quantity of the river and the changes that it has been facing over the past years.

I would like the consent of Venerable so that I can invite nuns for participating in my study. The nun's involvement in this project will be to be interviewed and involve in Participatory Rapid Appraisal (PRA) where they will use pens, markers and charts and give their opinions on water use, management and relation to Thimphu River.
During the PRA session, an audio recording will be taken using a digital device to capture their responses accurately. In some cases, where video-recording and taking of photos are deemed necessary, their consent will be sought prior to their inclusion in

the said recordings. It is estimated that the PRA will take approximately 2 hours their time,

Participation is voluntary and they have the right to withdraw at any stage without penalty. They may ask for the raw data to be returned to them or destroyed at any point. If they withdraw, I will remove information relating to you. However, once analysis of raw data starts on 30/June/2017, it will become increasingly difficult to remove the influence of their data on the results.

The results of the project may be published, but the name of the individual nun and the nunnery Centre may be assured of the complete confidentiality of data gathered in this investigation: their identity will not be made public without their prior consent. To ensure anonymity and confidentiality, their information as a participant will be coded. All of the information that they provide will be transcribed and secured in password-protected digital files at the University of Canterbury. Further, if they agree to take part in this study, they have the right to refuse to answer any of the questions. If they withdraw, all information they have provided will be destroyed.

Please indicate to the researcher on the consent form if they would like to receive a copy of the summary of results of the project.

The project is being carried out as a requirement for Masters Degree in Water Resource Management by Sonam Pem under the supervision of Dr. Kelly Dombroski and Julie Clarke who can be contacted at kelly.dombroski@canterbury.ac.nz and julie.clarke@canterbury.ac.nz. They will be pleased to discuss any concerns you may have about participation in the project.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

You can also contact my research assistant (fluent in Dzongkha) who can forward complaints. (Details of research assistant).

If you agree to participate in the study, you are asked to complete the consent form and return.

[The same consent form will be used as for the school]

Information Sheet for the Project Coordinator

Department of Waterways, College of Science
Telephone: +64 274279848
Email: sonam.pem@pg.canterbury.ac.nz

Understanding local perceptions and values towards Thimphu, River, Bhutan

Information Sheet for BAOWE Participants

Dear Sir/Madam,

I am a postgraduate student under the New Zealand Agency for International Development (NZAID) Scholarship Programme, which provides support towards earning my Master's Degree in Water Resource Management at the University of Canterbury, New Zealand.

The objective of the study is to explore and study the perceptions and attitudes of the local community towards Thimphu River and to explore about the relations and linkages between the communities and the River. The study will also cover the water quality and quantity of the river and the changes that it has been facing over the past years.

I would like the consent of Project Coordinator so that I can invite women from different projects under BAOWE for participating in my study. The women's involvement in this project will be to be interviewed and involved in a focus group where we will discuss their opinions on different water use and management in their own locality and how they link their use with Thimphu River.

During the focus group session, an audio recording will be taken using a digital device to capture their responses accurately. In some cases, where video-recording and taking of photos are useful, their consent will be sought prior to their inclusion in the said recordings (for example, when we use visual methods or write ideas on paper or whiteboards). It is estimated that the focus group will take approximately between 1 hour to 1 and half hour of their time.

Participation is voluntary and they have the right to withdraw at any stage without penalty. They may ask for the raw data to be returned to them or destroyed at any point. If they withdraw, I will remove information relating to them. However, once analysis of raw data starts on 30/June/2017, it will become increasingly difficult to remove the influence of their data on the results.

The results of the project may be published, but the name of the individual women and the project may be assured of the complete confidentiality of data gathered in this investigation: their identity will not be made public. To ensure anonymity and confidentiality, their information as a participant will be coded. All of the information that they provide will be transcribed and secured in password-protected digital files at the University of Canterbury. Further, if they agree to take part in this study, they have the right to refuse to answer any of the questions. If they withdraw, all information they have provided will be destroyed.

Please indicate to the researcher on the consent form if they would like to receive a copy of the summary of results of the project.

The project is being carried out as a requirement for Masters Degree in Water Resource Management by Sonam Pem under the supervision of Dr. Kelly Dombroski and Julie Clarke who can be contacted at kelly.dombroski@canterbury.ac.nz and julie.clarke@canterbury.ac.nz. They will be pleased to discuss any concerns you may have about participation in the project.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair,

Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

You can also contact my research assistant (his/her details) for further complaints or information.

If you agree to participate in the study, you are asked to complete the consent form and return.

[Same consent form will be used as for school]

Information Sheet for the National Environment Commission / Department of Hydrometeorology

Department of Waterways, College of Science
Telephone: +64 274279848
Email: sonam.pem@pg.canterbury.ac.nz

Understanding local perceptions and values towards Thimphu, River, Bhutan
Information Sheet for Government Participants

Dear Sir/Madam,

I am a postgraduate student under the New Zealand Agency for International Development (NZAID) Scholarship Programme, which provides support towards earning my Master's Degree in Water Resource Management at the University of Canterbury, New Zealand.

The objective of the study is to explore and study about the perceptions and attitudes of the local community towards Thimphu River and to explore about the relations and linkages between the communities and the River. The study will also cover the water quality and quantity of the river and the changes that it has been facing over the past years. For this purpose, I would like to get access to the information about the water quality and quantity of Thimphu River.

Participation by giving access to the data is voluntary and you have the right to withdraw at any stage without penalty. The Department and the Commission may ask for the raw data to be returned to them or destroyed at any point. If you withdraw, I will remove information relating to the Department and the Commission. However,

once analysis of raw data starts on 30/June/2017, it will become increasingly difficult to remove the influence of their data on the results.

The results of the project may be published, but the name of the person may be assured of the complete confidentiality of data gathered in this investigation: their identity will not be made public without their prior consent. To ensure anonymity and confidentiality, the information as a participant will be coded. All of the information provided will be transcribed and secured in password-protected digital files at the University of Canterbury. Further, if you agree to take part in this study, you have the right to refuse to answer any of the questions. If you withdraw, all information you have provided will be destroyed.

Please indicate to the researcher on the consent form if they would like to receive a copy of the summary of results of the project.

The project is being carried out as a requirement for Masters Degree in Water Resource Management by Sonam Pem under the supervision of Dr. Kelly Dombroski and Julie Clarke who can be contacted at kelly.dombroski@canterbury.ac.nz and julie.clarke@canterbury.ac.nz. They will be pleased to discuss any concerns you may have about participation in the project.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

You can also contact my research assistant (his/her details) for further complaints or information.

If you agree to participate in the study, you are asked to complete the consent form and return.

Appendix 4: Consent Form for Participating School

Department of Waterways/Geography
Telephone: +64 0274274898/+97517640540
Email: sonam.pem@pg.canterbury.ac.nz

Understanding local perceptions and values towards Thimphu River

Consent Form for Principal School

Include a statement regarding each of the following:

- ☐ I have been given a full explanation of this project and have had the opportunity to ask questions.
- ☐ I understand what is required of me if I agree to take part in the research.
- ☐ I understand that participation is voluntary and I may withdraw at any time without penalty. Withdrawal of participation will also include the withdrawal of any information I have provided should this remain practically achievable.
- ☐ I understand that any information or opinions I provide will be kept confidential to the researcher and that any published or reported results will not identify the participants or the school. I understand that a thesis is a public document and will be available through the UC Library.
- ☐ I understand that all data collected for the study will be kept in locked and secure facilities and/or in password protected electronic form and will be destroyed after five years.
- ☐ I understand the risks associated with taking part and how they will be managed.
- ☐ I understand that I can contact the researcher (Sonam Pem at sonam.pem@pg.canterbury.ac.nz, +97517640540) or supervisor Dr. Kelly Dombroski at Kelly.dombroski@canterbury.ac.nz for further information. If I have any complaints, I can contact the Chair of the University of Canterbury Human Ethics Committee, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)
- ☐ I would like a summary of the results of the project
- ☐ By signing below, I agree to participate in this research project.

Name:_Signed:_____Date:_____

Email address *(for report of findings, if applicable)*:_____

Appendix 5: Oral Scripts

Oral script for School Students

Project Title: Understanding local perceptions and values towards Thimphu River, Bhutan

My name is Sonam Pem. I am a Masters student in the Department of Waterways/Geography at University of Canterbury in New Zealand. For completion of my Masters Course in Water Resource Management, I have to do some research and write a thesis. For this purpose, I am here to carry out research on one of our urban waterways, Thimphu River. As my research involves perceptions of the local community towards the river, I would appreciate if you can contribute in providing your different opinions and perspectives towards the river. I am interested in your opinions because there is a stream that is managed by the school and I would like to know your roles in how the management is done and why in your opinion is it important for you in managing the stream or is it really important or not important.

To collect your opinions and perspectives, I have requested your Principal and parents for this session for carrying out a group activity. If you agree to participate, you will be taking pictures through these digital cameras, while touring the stream that the school is managing. I am of the opinion that the students who are participants here are actively taking care of the stream and I want to know more about that.

I will let one or two of the students to be in-charge of the tour and also let you take pictures of what you think is important.

The session should take between 1 to 2 hours. Please understand participation is entirely on a voluntary basis and any participant has the right to withdraw consent or discontinue participation at any time. Your teacher will provide another activity for you to do if you would like to withdraw. The benefits, which may reasonably be expected to result from this study, are reduced pollution levels of the rivers and enhancing community engagement in river protection and management.

I would like to tape record this session so as to make sure that I remember all the information provided accurately. I will keep these tapes in secured rooms and the transcriber to type the discussed issues will only use them. The transcriber has also signed confidentiality agreement not to disclose any information regarding the discussions.

My research assistant(s) also present here have signed confidentiality agreements not to disclose any identities of participants or information obtained from this visual method and group activity.

If you have any questions, you are free to ask them now. People interested in doing this research activity with me, please meet me at [appropriate place and time to be decided later].

If you have questions later, you may contact me at sonam.pem@pg.canterbury.ac.nz or sonampem.pem@gmail.com (I will give students a paper with my details). You can call or text me on 17640540 up until June 15th 2017 as I will be returning to New Zealand after that. While in New Zealand, you can always contact me on any of my email addresses. If you have any complaints, you can talk to your principal, or contact the Chair of the University of Canterbury Human Ethics Committee, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz). You can also contact your teacher in case of any complaints who can further refer the complaints to my research assistant and me.

Consent to Record the group activity (visual method) and discussion.
May I tape record this group activity (visual method) and discussion?

Consent to Quote from Interview
I may wish to quote from this group activity (visual method) and discussion either in the presentations or articles resulting from this work. A coded name will be used in order to protect identity of any participant, unless the participant specifically requests to be identified by their true name.

Do you allow me to quote from this group activity and discussion?

Consent to take photographs of the group activity and discussion.

May I take some photographs to capture the group activity (visual method) and discussions?

We will now take a short break to discuss **any issues you may have before we commence the visual method and group discussion. If anyone is not willing to participate please feel free to leave now and go to the alternative activity your teacher has organised.**

THANK YOU FOR YOUR TIME

Oral Script for Women's Association Focus Group

Project Title: Understanding local perceptions and values towards Thimphu River, Bhutan

Student name: Sonam Pem

Hello. My name is Sonam Pem. I am a Masters student in the Department of Waterways/Geography at University of Canterbury. For completion of my Masters Course in Water Resource Management, it is mandatory to complete a research thesis. For this purpose, I am here to carry out a research on one of our urban waterways, Thimphu River. As my research involves perceptions of the local community towards the river, I would appreciate if you can contribute in providing your different opinions and perspectives towards the river. I am interested in your opinions because being women, you are main water users especially in cleaning, cooking and various activities that you carry out daily.

To collect your opinions and perspectives, I have requested your Project Coordinator (BAOWE) for this session for carrying out focus group discussion. You are requested to participate by giving your opinions on the following point:

- A brief account of water use and management (daily and seasonal).
- The changes that have occurred over time in terms of water use, access and pollution.
- The challenges faced by residents and opportunities.
- How people relate with the river (values and beliefs)?
- Why they relate this way with the river?
- How you think people should relate with the river?
- What do people use the river for?
- What you feel are the major issues leading to pollution of the rivers?
- What you think should be done to improve the situation?
- How you think it should be done?
- Who should be responsible for the rivers?

The session should take between 1 to 2 hours. Please understand participation is entirely on a voluntary basis and any participant has the right to withdraw consent or discontinue participation at any time. The benefits, which may reasonably be expected to result from this study, are reduced pollution levels of the rivers and enhancing community engagement in river protection and management.

I would like to tape record this session so as to make sure that I remember all the information provided accurately. I will keep these tapes in secured rooms and the transcriber to type the discussed issues will only use them. The transcriber has also signed confidentiality agreement not to disclose any information regarding the discussions.

My research assistant(s) also present here have signed confidentiality agreements not to disclose any identities of participants or information obtained from this focus group discussion.

If you have any questions, you are free to ask them now. If you have questions later, you may contact me at sonam.pem@pg.canterbury.ac.nz or sonampem.pem@gmail.com. You can call or text me on 17640540 up until June 15th 2017 as I will be returning to New Zealand after that. While in New Zealand, you can always contact me on any of my email addresses. If you have any complaints, you can contact the Chair of the University of Canterbury Human Ethics Committee, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)

Consent to Record the focus group discussion

May I tape record this focus group discussion?

Consent to Quote from Interview

I may wish to quote from this focus group discussion either in the presentations or articles resulting from this work. A coded name will be used in order to protect identity of any participant, unless the participant specifically requests to be identified by their true name.

Do you allow me to quote from this focus group discussion?

Consent to take photographs of the focus group discussion

May I take some photographs to capture the focus group discussions?

We will now take a short break to discuss any issues you may have before we commence the focus group discussion. If anyone is not willing to participate please feel free to leave.

THANK YOU FOR YOUR TIME

Oral Script for Focus Group for Women's Association (BAOWE)

Project Title: Understanding local perceptions and values towards Thimphu River, Bhutan

Student name: Sonam Pem

Hello. My name is Sonam Pem. I am a Masters student in the Department of Waterways/Geography at University of Canterbury. For completion of my Masters Course in Water Resource Management, it is mandatory to complete a research thesis. For this purpose, I am here to carry out a research on one of our urban waterways, Thimphu River. As my research involves perceptions of the local community towards the river, I would appreciate if you can contribute in providing your different opinions and perspectives towards the river.

To collect your opinions and perspectives, I have requested Venerable for her consent to carry out Participatory Rapid Appraisal. You are invited to participate by drawing and writing on the chart paper, which I will provide. There are various tasks that need to be carried out which are as follows:

- Space related PRA methods
- Resource map: you will be made to map out your water resources,
- Your water source,
- Drainage and how it is connected to Thimphu River
- Whether you manage the water that flows within their community, if so how is the management carried out.
- Time-related PRA methods
- Daily activity schedule: You will be made to draw a diagram of your daily schedule related to water and arrange in a timeline from morning till night. After that you can then give the different use in different season by following seasonal calendars.
- Time line method: You will be made to give opinions through drawing about the historical water use and management in the community.

- Trend analysis: You will give the views on the changes you have experienced with water issues and the changes that you have seen to the river.
- PRA relation methods
- Impact flow analysis: Through drawing, you can show the different impacts (example, pollution, flow reduction) caused due to different activities in your community. And what are the impacts of these on the different values that you hold towards water and the river.

The session should take between 1 to 2 hours. Please understand participation is entirely on a voluntary basis and any participant has the right to withdraw consent or discontinue participation at any time. The benefits, which may reasonably be expected to result from this study, are reduced pollution levels of the rivers and enhancing community engagement in river protection and management.

I would like to tape record this session so as to make sure that I remember all the information provided accurately. I will keep these tapes in secured rooms and the transcriber to type the discussed issues will only use them. The transcriber has also signed confidentiality agreement not to disclose any information regarding the discussions.

My research assistant(s) also present here have signed confidentiality agreements not to disclose any identities of participants or information obtained from this PRA session.

If you have any questions, you are free to ask them now. If you have questions later, you may contact me at sonam.pem@pg.canterbury.ac.nz or sonampem.pem@gmail.com. You can call or text me on 17640540 up until June 15th 2017 as I will be returning to New Zealand after that. While in New Zealand, you can always contact me on any of my email addresses. If you have any complaints, you can contact the Chair of the University of Canterbury Human Ethics Committee, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)

Consent to Record the PRA discussion

May I tape record this focus group discussion?

Consent to Quote from Interview

I may wish to quote from this PRA either in the presentations or articles resulting from this work. A coded name will be used in order to protect identity of any participant, unless the participant specifically requests to be identified by their true name.

Do you allow me to quote from this PRA?

Consent to take photographs of the PRA

May I take some photographs to capture the PRA?

We will now take a short break to discuss any issues you may have before we commence the focus group discussion. If anyone is not willing to participate please feel free to leave.

THANK YOU FOR YOUR TIME

Oral Script for Local Residents / Housewives

Project Title: Understanding local perceptions and values towards Thimphu River, Bhutan

Student name: Sonam Pem

Hello. My name is Sonam Pem. I am a Masters student in the Department of Waterways/Geography at University of Canterbury. For completion of my Masters Course in Water Resource Management, it is mandatory to complete a research thesis. For this purpose, I am here to carry out a research on one of our urban waterways, Thimphu River. As my research involves perceptions of the local community towards the river, I would appreciate if you can contribute in providing your different opinions and perspectives towards the river.

To collect your opinions and perspectives, you will be interviewed for 45 minutes to 1 hour.

Please understand participation is entirely on a voluntary basis and any participant has the right to withdraw consent or discontinue participation at any time. The benefits, which may reasonably be expected to result from this study, are reduced pollution levels of the rivers and enhancing community engagement in river protection and management.

I would like to tape record this session so as to make sure that I remember all the information provided accurately. I will keep these tapes in secured rooms and the transcriber to type the discussed issues will only use them. The transcriber has also signed confidentiality agreement not to disclose any information regarding the discussions. With your consent, I will also take photos of everyday practices making sure to avoid your face.

If you have any questions, you are free to ask them now. If you have questions later, you may contact me at sonam.pem@pg.canterbury.ac.nz or sonampem.pem@gmail.com. You can call or text me on 17640540 up until June 15th

2017 as I will be returning to New Zealand after that. While in New Zealand, you can always contact me on any of my email addresses. If you have any complaints, you can contact the Chair of the University of Canterbury Human Ethics Committee, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)

Consent to Record the semi-structured interview

May I tape record this interview?

Consent to Quote from Interview

I may wish to quote from this semi-structures interview either in the presentations or articles resulting from this work. A coded name will be used in order to protect identity of any participant, unless the participant specifically requests to be identified by their true name.

Do you allow me to quote from this semi-structured interview?

Consent to take photographs of the residence during the semi-structured interview

May I take some photographs to capture our semi-structured interview and your everyday practices of water use?

Appendix 6: Transcription Confidentiality Agreement

TRANSCRIPTION CONFIDENTIALITY AGREEMENT

Thank you for your participation in the research project "Understanding local perceptions and values towards Thimphu River, Bhutan". Protecting the confidentiality of the research participants is essential and you are therefore asked to sign the following confidentiality agreement.

I, __Sonam Pem___, agree to maintain full confidentiality in regards to any and all verbal information and audio recordings received from the research team for the above project. Furthermore, I agree:

1. To hold in strictest confidence the identification of any individual and the content of any discussion that may be revealed during transcription
2. To not make copies of any audio files or computerised files of the transcribed focus groups, unless specifically approved to do so by the Research Team leader Sonam Pem.
3. To store all audio files and materials in a password protected computer or safe, secure location as long as they are in my possession.
4. To return all materials to Sonam Pem in a complete and timely manner at the completion of transcription
5. To delete all electronic files containing study-related documents or audio files from my computer hard drive and any back-up devices on completion of transcription.

I am aware that I can be held legally responsible for any breach of this confidentiality agreement, and for any harm incurred by individuals if I disclose identifiable information contained in the audio files and/or files to which I will have access.

Name (printed) _____

Signature _____

Date _____